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Baseline Assessment of Information Technology Contracts Funded by Commander, Naval Surface Forces

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March 2010

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This project developed a baseline assessment for assisting Commander, Naval Surface Forces (CNSF) leaders and managers in understanding and improving the following information technology programs: Training and Operational Readiness Information Services (TORIS), Continuous Monitoring Program (CMP), and the CNSF Web. The programs were described, assessed, and evaluated in terms of their backgrounds, mission needs, performance, technical requirements, functionality, and contractual terms.

One conclusion was that the contractual statement of work does not measure the performance of the system; rather, it is designed to mandate the requirements for the contractor's performance (e.g., indicators that measure downtime, trouble calls, and software bugs are missing). An overarching recommendation is to integrate all staff information technology functions under one authority, while establishing simple and relevant program performance benchmarks to measure and track actual performance.

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BASELINE ASSESSMENT OF INFORMATION TECHNOLOGY CONTRACTS FUNDED BY COMMANDER, NAVAL SURFACE FORCES

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LIST OF ACRONYMS AND ABBREVIATIONS

AEL	Authorized Equipment Listing
AEPP	ATG Enterprise Personnel Program
AOI	Areas of Interest
ARRC	Automatic Reorder Restriction Code
AT	Allowance Type
ATG	Afloat Training Group
ATGPAC	Afloat Training Group, U.S. Pacific Fleet
ATO	Authority to Operate
BOR	Budget OPTAR Report
C5I	Command, Control, Communications, Computers, Combat Systems, and Intelligence
C5RA	C5 Readiness Assessment
CASREP	Casualty Reports
CFFC	Commander, Fleet Forces Command
CFT	Cross Functional Teams
CINCLANTFLT	Commander in Chief, U.S. Atlantic Fleet
CINCPACFLT	Commander in Chief, U.S. Pacific Fleet
CIO	Chief Information Officer
CLASSRON	Class Squadron
CMP	Continuous Monitoring Program
CNO	Chief of Naval Operations
CNSF	Commander, Naval Surface Forces
CNSL	Commander, Naval Surface Force, U.S. Atlantic Fleet
CNSP	Commander, Naval Surface Force, U.S. Pacific Fleet
CRO	Current Readiness Officer
CUSFFC	Commander, U.S. Fleet Forces Command
DADMS	Department of the Navy Application and Database Management System
DFS	Departure From Specifications Database
DLR	Depot Level Repairable

DoD	Department of Defense
DoN	Department of the Navy
DRRS	Defense Readiness Reporting System
DRRS-N	Defense Readiness Reporting System-Navy
FRP	Fleet Response Plan
FSM	Food Service Management
FSO	Food Service Officer
FY	Fiscal Year
ISIC	Immediate Superior in Command
LAN	Local Area Network
LOK	Level of Knowledge
MOF	Material Outstanding File
MSP	Master Scheduling Program
NAVSUP	Naval Supply Systems Command
NETWARCOM	Naval Network Warfare Command
NIPRNET	Nonsecure Internet Protocol Router Network
NMCI	Navy Marine Corps Intranet
NMETL	Navy Mission Essential Task List
NRRE	Navy Readiness Reporting Enterprise
NTIMS	Navy Training Information Management System
NWTS	Navy Warfare Training System
OPTAR	Operating Target
OSD	Office of the Secretary of Defense
PII	Personally Identifiable Information
PKI	Public Key Infrastructure
ROI	Return on Investment
ROM-II	Retail Operation Management
R-Supply	Relational Supply
SAN	Storage Area Network
SES	Senior Executive Service
SFOM	Supply Figure of Merit
SFTM	Surface Force Training Manual

SGM	Strike Group Matrix
SIM	Selected Item Management
SIPRNET	Secret Internet Protocol Router Network
SIT	Ship in Training
SPAWAR	Space and Naval Warfare Systems Command
SQL	Structured Query Language
SSL	Secure Socket Layer
SUBFOR	Commander, Submarine Force
SUPPO	Supply Officer
SURFOR	Commander, Naval Surface Forces
SURFSUP	Surface Force Supply Procedures
SWE	Surface Warfare Enterprise
TFOM	Training Figure of Merit
TORIS	Training and Operational Readiness Information Services
TYCOM	Type Commander
ULTRA	Unit Level Training Readiness Assessment
ULTRA-C/E	Certification/Engineering
ULTRA-S	Sustainment
URL	Uniform Resource Locator
WFIP	War Fighting Improvement Program
XML	Extensible Markup Language

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I. INTRODUCTION

A. BACKGROUND

The 2009 tightening global, national, and federal defense financial environment has generated the requirement for all government agencies to examine every possible means to reduce the cost of doing business. The possibility that there may be overlap in information-technology-related contracts between East Coast and West Coast entities prompted Commander, Naval Surface Forces' (CNSF) need for an independent analysis. Identification and/or modification of redundancies could yield cost savings while improving efficiencies in the contracting process. To this end, three information technology programs supporting CNSF and subordinate units within their claimancy are examined.

The purpose of this project was to assess these major IT-related programs providing services to CNSF staff personnel (East and West Coast) and subordinate commands within CNSF's purview. The programs of study identified by the project sponsor, the CNSF Comptroller, were: Training and Operational Readiness Information Services (TORIS), Continuous Monitoring Program (CMP), and the CNSF Web. This study describes factors affecting program performance and evaluation. The expectation is to provide insights to decision makers that can assist them in determining the best possible method for achieving reductions in cost, improvements in program efficiencies, and development of performance standards.

B. RESEARCH QUESTIONS

The following research questions apply:

- What programs are currently being funded?
- Why are they being funded? What programs and commands do they affect?
- What commands do they support?
- What are the specific services to be supported as identified by their contract terms?
- Are there redundancies in services provided amongst the various programs?

C. POTENTIAL BENEFITS

The greatest potential benefit from this project lies in making modifications designed to cut costs and/or improve efficiencies and reduce the possible redundancies in major information technology programs. CNSF's unique recent history involved merging two geographically separated Type Commanders (TYCOMs), while allowing both staffs to continue operating and maintaining their current level of service.

The second benefit that this project aims to provide is more conceptual in nature. It aims to support the strategic information superiority goals of the Department of the Navy (DoN). According to the DoN Chief Information Officer (CIO):

> One of the underlying tenets in pursuit of information superiority in the DoN is the ability to focus resources on Information Technology investments that are the most effective in achieving that superiority. This is manifested directly by investing in information technology that supports the warfighting mission by providing secure information when and where it is needed. It is also manifested by focusing on information technology investments that improve the mission and strategic objectives of all DON organizations, afloat and ashore, that directly or indirectly support the warfighting mission. (Department of the Navy, 2001a)

Therefore, from the strategic perspective, this project aims to ensure that these programs support the warfighter by directly complementing the CNSF mission and the Surface Warfare Enterprise (SWE) Charter.

D. METHODOLOGY

The following actions were taken to accomplish this project. First, the authors met with the project sponsor to determine the project scope and breadth, as well as to gather relevant background and historical information. Second, meetings were conducted with the respective program managers for the three subject programs. These meetings were designed to answer the who, what, where, when, and why of each program, while also providing information on the mission, performance, management, financial, and technical areas of each system. Finally, interviews were conducted with end users to integrate their feedback into the overall analysis.

The combination of the three primary information sources: the project sponsor, the program managers, and the end users, collectively forms the basis for the research.

E. ORGANIZATION OF THE PROJECT

This paper is separated into five chapters. The first chapter explains the project sponsor's problem and the approach used to solve it. The second chapter provides background information on the project sponsor's command. In addition, it defines baseline assessment in terms of information technology. The third chapter details each of the three major programs identified. The fourth chapter describes the qualities and attributes of successful information technology programs, and it presents the findings from the program manager and user feedback interviews. Finally, the last chapter offers the findings from the research, including suggestions for follow-on research.

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II. BACKGROUND

A. INTRODUCTION

This chapter provides an overview of a baseline assessment and its relationship to information technology resources. In addition, it provides background on the history, organization, and staff objectives of Commander, Naval Surface Forces (CNSF). The goal of the chapter is to establish a fundamental understanding as to what a baseline assessment of CNSF information technology resources entails, and why an assessment is important in the subject situation.

B. PROPERTIES OF A BASELINE ASSESSMENT

1. Definition of Baseline

As a noun, a baseline is defined as a starting point, one which can be used to draw critical observations or data from in the effort of comparison (baseline, Merriam-Webster Online Dictionary, n.d.). The implied intention would then be to judge improvement from the initial baseline to some improved state (baseline, BusinessDictionary.com, n.d.).

To convert baseline to an adjective, as done with this project, it is implied that we are concerned with the initial effort to draw observations and data from the subject system to produce a standard. The goal of such an exercise would then be to identify concerns and recommended solutions.

A baseline objective can be obtained in various scenarios. For example, a baseline performance can be derived from a professional baseball player's rookie season. In this case, numerous statistical categories would be assembled at the conclusion of the season. While follow-on analysis would provide areas for improvement, subsequent seasonal statistics would then be compared against the baseline performance to measure the success rate of the analysis.

Therefore, baseline in this case is the initial kind of review to draw observations and data from the subject systems.

2. Definition of Assessment

An assessment is the action of determining the importance, size, or value of something (assessment, Merriam-Webster Online Dictionary, n.d.). In addition, it does much more than that. Simply assigning an assessment to be completed makes an organization's intentions known that the targeted program is of significant importance to leadership due to the resources it promised toward its completion. Also, it dictates that the organization must clearly spell out what composes, or detracts from, value in the target program. Finally, it implies that the resulting information will be utilized in such a way as to explain and improve performance (Pittsburg State University, 2007).

In this situation, when the project sponsor offered the original concept, all three of the above points were made known within the organization. Therefore, while the authors complete the action of determining the importance, size, or value of the subject systems, the project sponsor made a forceful statement to the stakeholders of each program.

3. The Relationship between a Baseline Assessment and Information Technology

It is in the best interest of an organization to develop and promulgate strategies, goals, and missions. This enables the organization to focus on what is the best course of action and use of resources to accomplish those goals, by way of the assigned strategy. Information technology is an example of one type of resource that can be used to reach an organization's goals. Information technology is not normally the solution, but is instead a means to achieve a goal. For example, an organization may set a goal to develop and support the families of its personnel. The organization may then develop a strategy to support that goal, which may include information technology systems, such as an online virtual community for information sharing and/or collaboration amongst families.

At the time of origination, the virtual community for information sharing may have adequately supported the goal, as it connected strangers, linked by a common bond to each other for grouping purposes. However, as time goes on, either the organization's goal or the characteristics of the virtual community may change either—perhaps family development is no longer a primary concern of management or the operation of the

system represents a significant percentage of the discretionary budget of the organization. In any case, it is prudent that the organization review its tools and methods it uses to reach its goals.

Unfortunately, information technology is unique in that it involves hardware and software systems, which are both physical and logical in nature. This presents a challenge for an expedient, periodic review because information technology, while seemingly similar, is usually uniquely configured, making it one-of-a-kind, technical, and extremely dynamic.

So, a course of action for an organization to address how it is meeting its goals via information technology is to conduct a baseline assessment of its information technology resources. The baseline assessment, which is the initial action to draw observations and data in order to determine the importance, size, or value of the subject systems, would provide not only the required guide for improvement, but also a template for subsequent reviews in the future.

Finally, while federal law does not mandate a review of this type for information technology systems in operation, it is required for major systems in the acquisition phase. However, according to the U.S. Office of Management and Budget (OMB), conducting a baseline assessment of minor programs is good practice because it provides the organization with useful information to compare already deployed and prospective systems (Government Accountability Office, 2009).

C. COMMANDER, NAVAL SURFACE FORCES (CNSF) BACKGROUND

1. History

Within the previous decade, the project sponsor, CNSF, has undergone a period of tremendous transformation. The following is a brief summary of its recent history, as found in the Battle Orders of CNSF.

In 2001, Commander, Fleet Forces Command (CFFC) was created. Commander in Chief, U.S. Atlantic Fleet (CINCLANTFLT), was selected by the Chief of Naval Operations (CNO) to be concurrent CFFC, with Commander in Chief, U.S. Pacific Fleet

(CINCPACFLT), as the follow organization (in other words, the second organization). CFFC was then overall responsible for the integrated requirements of the manning, training, and equipping of the Atlantic and Pacific Fleets. This is important to note because this action was the forerunner for what would occur later within the more specialized Surface Fleet.

Then, in 2004, CFFC established subordinate Type Commander (TYCOM) organizations for the various warfare operating forces. The design installed a three-star lead and a two-star follow TYCOM on the opposite coast. At this time, CNSF was designated as the lead TYCOM while acting concurrently as the Commander in Chief, U.S. Pacific Fleet. Commander, Naval Surface Force, U.S. Atlantic Fleet (CNSL) would be the follow TYCOM. Originally, CNSF was tasked with the development and promulgation of policy, while CNSL would be responsible for the readiness of all warships within the claimancy.

The following year, CNSF developed the Surface Warfare Enterprise (SWE) in accordance with the Navy Enterprise Concept; see Figure 1. Its mission was the development of a professional system of surface ships and sailors, able to be employed by the Combatant Commanders. Most important to note concerning the concept of the SWE was its mandate to collaborate in advance with all stakeholders, or providers, as opposed to the development within a stovepipe. Example providers include Naval Supply Systems Command (NAVSUP) and Space and Naval Warfare Systems Command (SPAWAR).

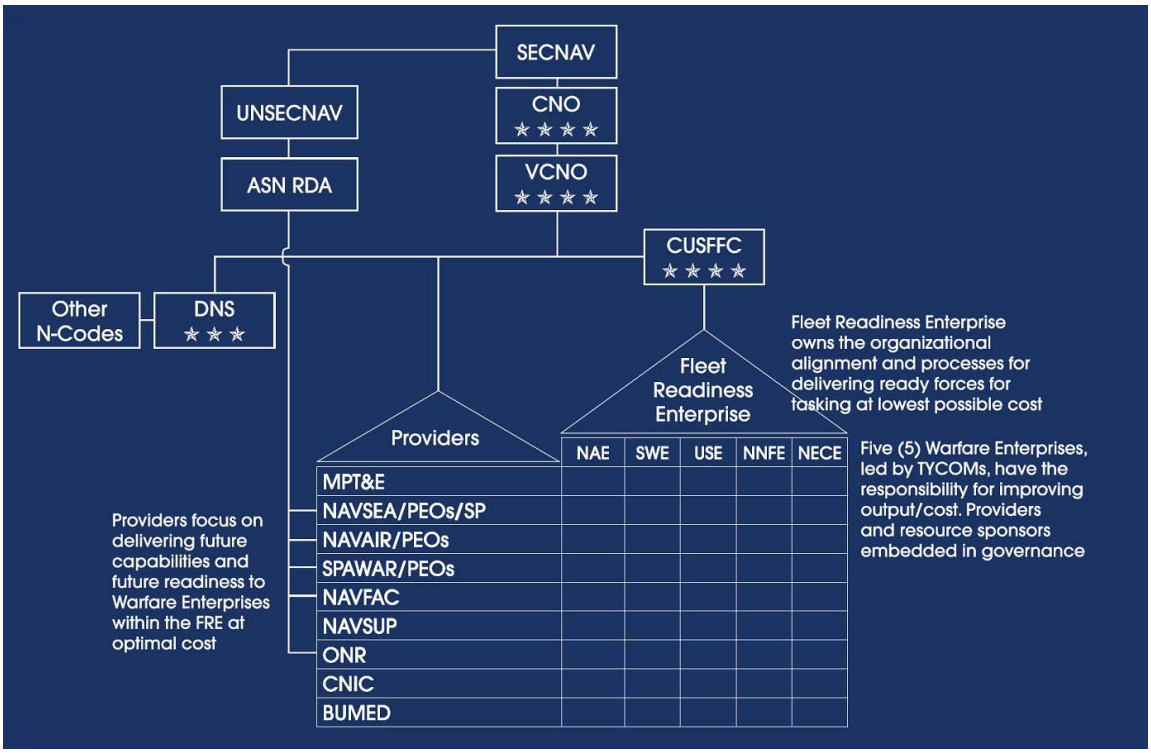

Figure 1. The Navy Enterprise Concept (Commander, Naval Surface Forces, 2008b)

The CNO renamed CFFC to Commander, U.S. Fleet Forces Command (CUSFFC) in 2006, which it is known as to this date.

Also in that year, SWE officially stood up. In addition, it formally designated CNSL as the Current Readiness Officer (CRO) of the surface forces, and it launched Class Squadrons (CLASSRONs), based on ship classes, as subordinates to the CRO (Commander, Naval Surface Forces, 2009).

2. Organization Structure of Key Stakeholders

The following section describes the organization of the Surface Warfare Enterprise, CNSF, and one staff code within CNSF–the Comptroller N00F code.

a. Surface Warfare Enterprise

The SWE is governed by the Surface Board, which is composed of Flag Officers and Senior Executive Service (SES) leaders of the various commands that collectively compose the surface enterprise. The Board is headed by the Commander,

Naval Surface Forces. The goal of the Surface Board is to closely collaborate between the various stakeholders to ensure that the maximum synergy occurs as capabilities are aligned toward the SWE objectives.

There are eight Cross Functional Teams (CFT) that report to the Surface Board via the SWE Deputy. These teams are developed as multi-disciplinary from the stakeholder commands and are mandated to focus on collaboration across each CFT, vice operation within specific stovepipe duties and responsibilities. See Figure 2.

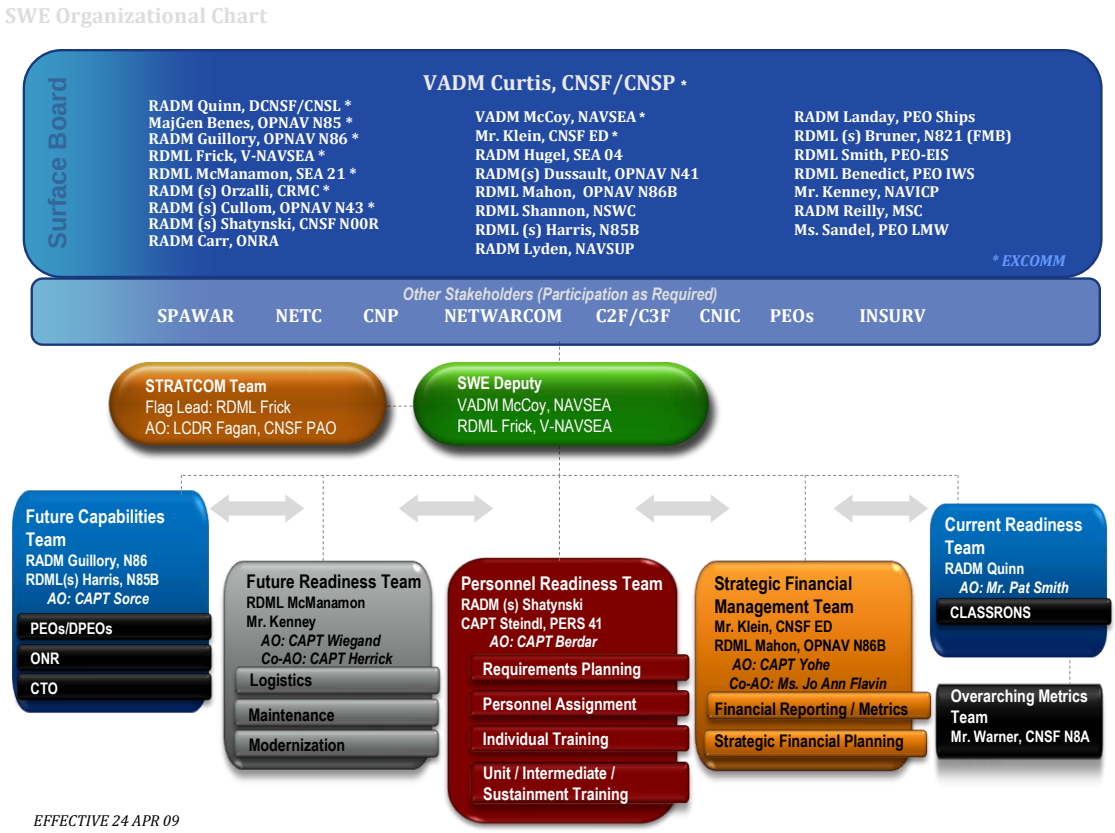

Figure 2. SWE Organization Chart (Commander, Naval Surface Forces, 2009a)

b. Commander, Naval Surface Forces

The CNSF organization, a three-star command, is considered one organization with two staffs. While this may seem redundant, it is important to remember original 2004 concept that CNSF was formed to fulfill: one staff, CNSP, was designated as the policy writer and the second, CNSL, was the supporter of warship

readiness, with the CLASSRONs reporting to it. So, the two staffs do not possess concurrent responsibilities, but rather complement each other. They form two halves that combine to act in unison as a single staff. See Figure 3.

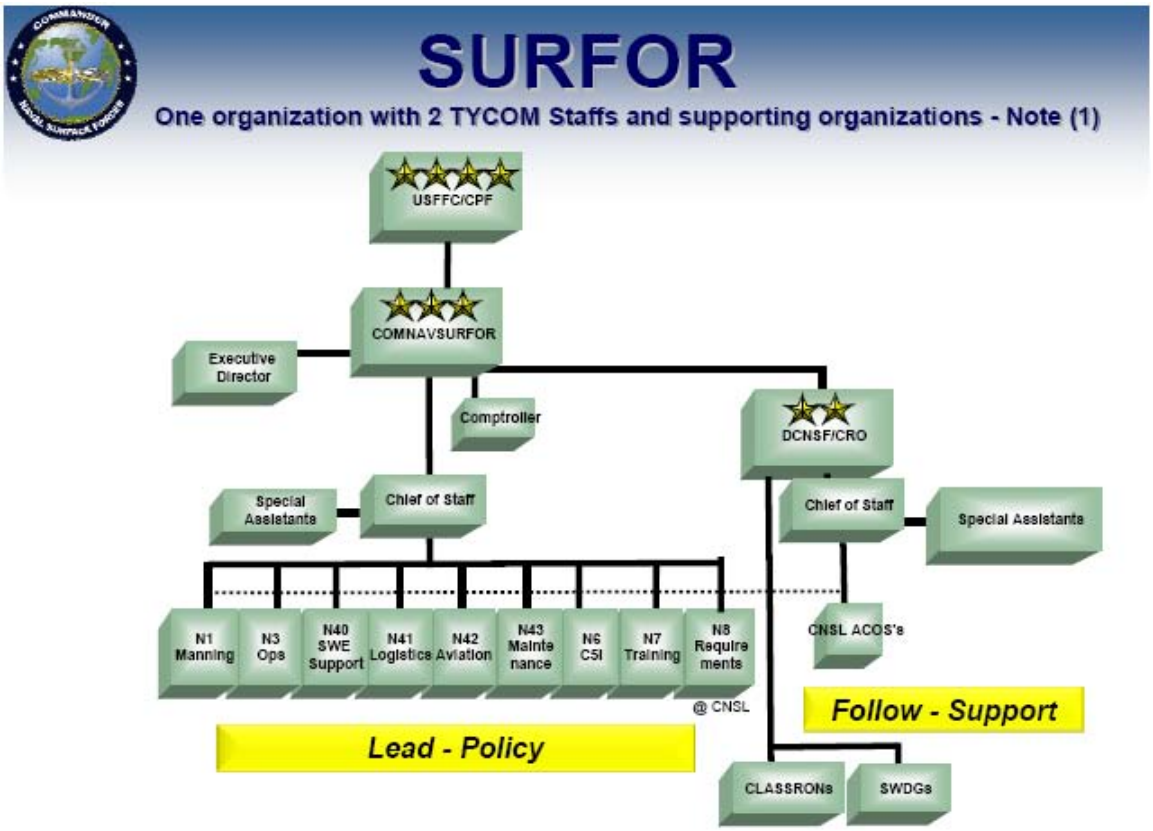

Figure 3. CNSF Organization Chart (Commander, Naval Surface Forces, 2009a)

c. CNSF N00F Organization

It is important to point out that there is one code within CNSF that does not fit precisely into the two staff construct. The Comptroller department, Code N00F, is led by a Department of the Navy (DoN) civilian, located at CNSF headquarters, who manages two staffs, one on either coast. The Comptroller is responsible to CNSF for the fiscal accountability of the organization as a whole and for the proper distribution of funding. In addition, the comptroller submits future budget requests as required.

Due to the unique fiduciary responsibility of the position, the Comptroller is the only department head charged with managing operations on both coasts. See Figure 4.

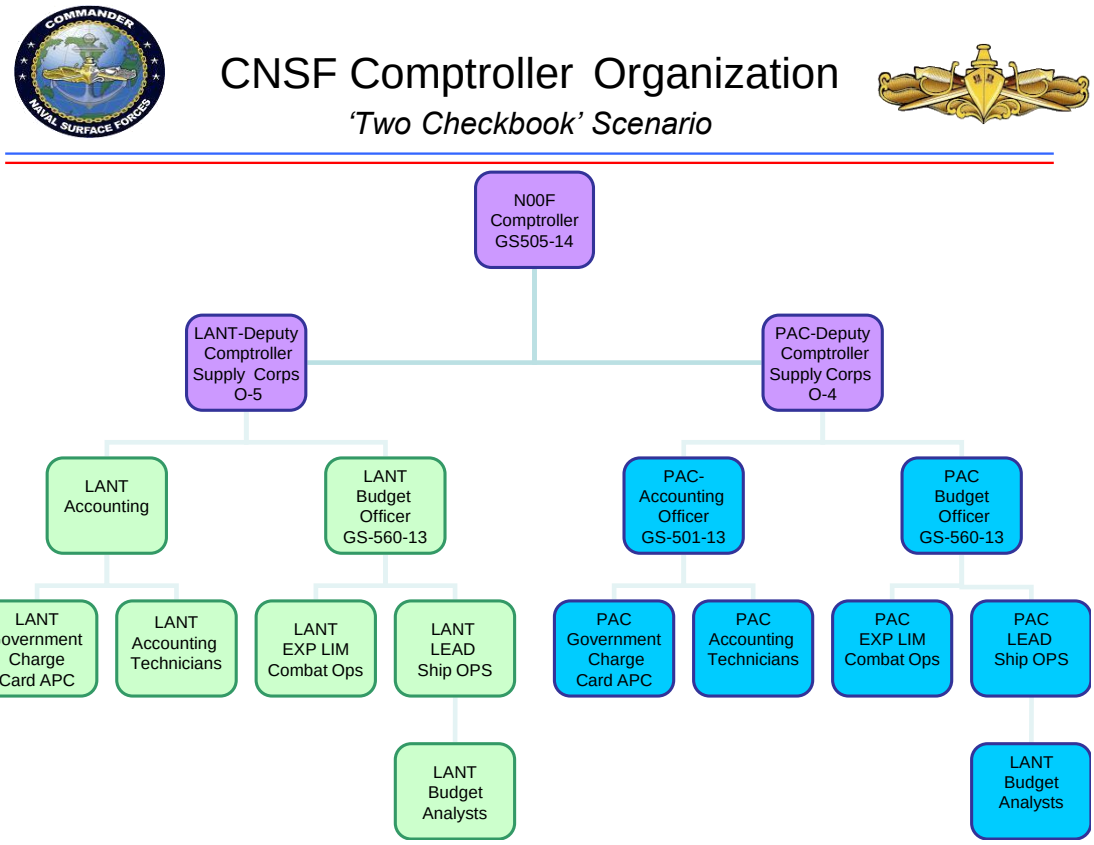

Figure 4. CNSF Comptroller Organization Chart (Commander, Naval Surface Forces, 2007a)

3. CNSF Staff Objectives

The CNSF staff objectives are developed in support of the organization's mission statement, which reads:

> SURFOR provides operational commanders with well-trained, highly effective, and technologically superior surface ships and Sailors. To sustain peak levels of combat readiness, SURFOR equips its forces with the necessary training, tools, maintenance and material to successfully accomplish their mission — across the entire spectrum of warfare operations. (Commander, Naval Surface Forces, 2009)

In addition, CNSF staff objectives are delineated by specific duties and responsibilities, to ensure that departments are properly aligned to avoid any duplication of effort. The following section describes staff objectives by functional grouping in greater detail.

a. CNSF/CNSP

CNSF is responsible as the TYCOM for the Pacific surface ships to Commander, U.S. Pacific Fleet for executing U.S. Code Title 10 responsibilities for manning, training, and equipping those ships. In addition, it answers to CUSFFC for any surface warfare request for forces. Also, CNSP is responsible for the management of the Littoral Combat Ship class. Finally, as the Pacific lead, it tracks Pacific ship readiness via West Coast ISICs and CLASSRONs.

b. CNSL

First, CNSL is responsible as the TYCOM for the Atlantic surface ships to CUSFFC for executing Title 10 responsibilities for manning, training and equipping those ships. In addition, as CRO, it monitors the readiness of all surface ships. This entails metric development, tracking, and analysis, through the CLASSRONs, as well as collaborating with the SWE CFTs, as required. Finally, as the Atlantic lead, it tracks Atlantic ship readiness via east coast ISICs and CLASSRONs.

c. Afloat Training Groups (ATG)

These organizations, subordinate to the TYCOMs, are tasked with the training of warships in the pre-deployment phase. In addition, they conduct certifications that graduate surface ships to the deployment phase.

d. CLASSRONs

CLASSRONs are intermediate level organizations between the shipboard and TYCOM echelons. They are composed of analysts and support staff that are responsible to and work with the CRO and its staff to identify and resolve any issues within the domain of the surface fleet's readiness.

e. N1–Manpower and Personnel

The Manpower and Personnel directorate splits its efforts between TYCOM and SWE responsibilities. Specifically, CNSL N1 is accountable for current and future manning and billeting readiness issues to the CRO. CNSP N1 leads the Program Objectives Memorandum effort and all civilian manning issues.

f. N3–Operations and Plans

The N3 Department is focused on the current and future operations of the Force. Both coasts detail deployment schedules for their ships, and then they calculate dwell and home tempo times to ensure that no limits are breached. CNSL N3 additionally is the lead staff for Intelligence and Anti-Terrorism/Force Protection concerns. On the West Coast, CNSP N3 manages hull swap and homeport shifts across the fleets.

g. N41–Supply and Logistics

In addition to its TYCOM responsibilities, CNSP N41 is responsible for all supply and logistics policy and guidance. CNSL N41 performs its TYCOM responsibilities while reporting to the CRO on all systemic, logistics problems.

h. N6–Combat Systems and C4I

The primary attention of CNSP N6 is the future readiness of the fleet's C5I capabilities. CNSL N6 is focused on the current C5I readiness of the fleet. In addition, CNSL N6, supported by CNSP N6 is charged with the collection and distribution of all operationally significant ships readiness data, for example, casualty reports (CASREPs).

i. N7–Training and Readiness

The most important duty for CNSP and CNSL N7 is the development of training policy for the fleet. The secondary responsibility is monitoring the training readiness of the fleet. Similar to the other codes, CNSP is designated as the lead for this effort, while CNSL is the follow staff.

j. N8–Force Requirements and Assessments

N8 is a staff code focused on developing policy to support the future requirements of the fleet. Due to its close relationship with CUSFFC, the lead staff is located at CNSL headquarters vice CNSP. The functions of the Department are varied, but mostly cover the following areas: coordination with the SWE Strategic Financial Management CFT to lead the Force's Planning, Programming, Budgeting, and Execution efforts, development, and tracking of metrics for both individual, unit, and force level requirements, and management of the organization's Joint Capability Integration and Development System (Commander, Naval Surface Forces, 2009a).

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III. CNSF IT SYSTEMS REVIEW AND DESCRIPTION

To quote Thomas Friedman, "the world is flat," and as Figure 5 shows, the same is true for the major information systems we profiled at CNSF (Friedman, 2005). While they are considered internal programs for management sake, all three are connected with external stakeholders in some form or fashion. For example, CNSF Web provides information to families, media, and researchers, while Training and Operational Readiness Information Services (TORIS) and Continuous Monitoring Program (CMP) communicate through the Navy Readiness Reporting Enterprise (NRRE) to the Pentagon to provide real-time status of forces updates. As Figure 5 depicts, both CMP and TORIS feed the Defense Readiness Reporting System (DRRS) via its Navy component system.

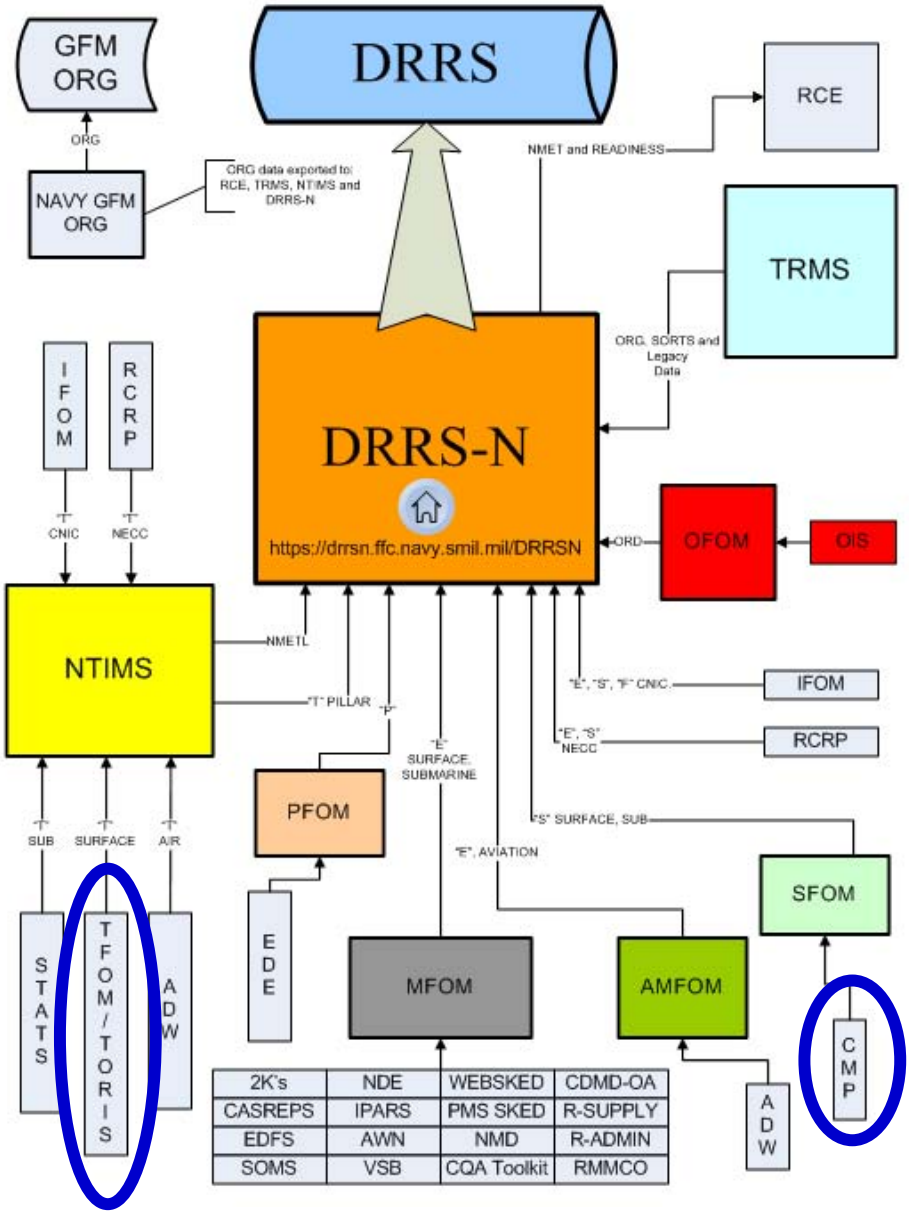


Figure 5. Relational Overview between TORIS, CMP, and DRRS (Commander, Naval Surface Forces, 2008c)

This chapter contains an in-depth discussion of each of the three major information systems: TORIS, CMP, and CNSF Web. It expressly details their background, mission needs, and technical requirements. In addition, it provides a brief

system description for each. The intent of the section is to provide the user with a basic understanding of what each system is, how it works the way that it does, and what mission it is designed to support.

A. TRAINING AND OPERATIONAL READINESS INFORMATION SERVICES (TORIS)

TORIS is a Web-centric data-engine that receives inputs from afloat and ashore units. It stores, displays, and transmits the data to external information systems upon request or via automatic schemes. Its focus is the training readiness of the surface force.

1. System Background

TORIS was developed immediately following the terrorist attacks of 9/11. At the time, a requirement was identified to provide an instant snapshot of the current training readiness of the surface fleet to leadership. The intent of the program, the development task of which was delegated to mobilized reservists, was to enable the Immediate Superior in Command (ISIC) and Type Commanders (TYCOMs) with the ability to identify warships ready for deployment to the Combatant Commanders. It did so by providing Commanding Officers at the unit level with a current view of their ship's training readiness, which could be compared to the ATG's required metrics (Commander, Naval Surface Forces, 2008d).

In 2003, the Chief of Naval Operations (CNO) directed Commander, U.S. Fleet Forces Command (CUSFFC) to develop a plan that would substantially improve the Navy's deployed warfighting capability. This was in response to concerns that only a small percentage of Navy vessels were deployed or, worse yet, deployable at any one point in time. Also, there were specific concerns that the ISICs and TYCOMs did not have a firm grasp on the readiness of units still in the pre-deployment training phases. So, CUSFFC promulgated the Fleet Response Plan (FRP), which the CNO approved in May 2003. The plan required that the Navy be able to deploy eight carrier strike groups

within 90 days of notification, and it was known as the "6 + 2" goal. To do so would require a massive improvement in the Navy's training cycle (Government Accountability Office, 2005).

So, in March 2004, CNSF introduced a new training process called SHIPTRAIN. According to CNSF:

> SHIPTRAIN is the primary means to align and integrate processes to effectively and efficiently produce warships and trained crews continuously ready for operational mission tasking, which is the product of the Surface Warfare Enterprise (SWE). (Commander, Naval Surface Forces, 2007b).

It was developed to support "Sea Power 21, the training requirements of the Navy Mission Essential Task List (NMETL), and the Navy Warfare Training System (NWTS)" (Taylor, 2004). To do so, it shifted unit level training to a continuous process, thus reducing the time requirement for training and follow-on assessment and certification by 75% (SURFOR Public Affairs, 2006). As Vice Admiral Etnyre, the former Commander, Naval Surface Forces, wrote, "Gone are the days of 'ramping up' to deploy. We have to be ready when called. Training MUST prepare us to fight. Continuous training will do that and keep us ready–all the time, anywhere" (Etnyre, 2007).

The primary tools that enabled SHIPTRAIN's efficiencies were TORIS and Training Figure of Merit (TFOM). TFOM was a software application that tracked ship's training data in various warfare categories. It initially tracked only Engineering, Strike and Air warfare areas. However, over the following two years, it added functionality to support all warfare areas. It achieved its efficiencies by eliminating duplicative training requirements and populating its results on the ship's local area network for command leadership review and action.

In 2005, TORIS absorbed TFOM as one of its primary applications. From then on, units could populate the TFOM application via Web-centric TORIS, which stored the data and allowed authorized stakeholders to view and compare data to assess current training readiness. While enhancing visibility off hull, it also was designed to be user-friendly (Irwin, 2005).

In 2006, Afloat Training Group, U.S. Pacific Fleet (ATGPAC), the responsible command for TORIS, received an award from *CIO* Magazine. The command was recognized for its successful design and implementation of TORIS. According to the Navy press release, TORIS was awarded due to its "reduction of administrative overhead that was previously needed to store, compile, organize and extract data, making training more efficient by providing a Web-based tool for inputting data and transmitting it to a central data warehouse for analysis" (Ludwick, 2006).

2. Mission Need

TORIS supports the training readiness of the fleet. By doing so, it builds toward the currently available war-fighting capability of the force. It provides for these goals via three major routes. The first deals with the onboard training record processes. The second is through the time-shortened inspection certification processes. The third is via the automatic population of DRRS via TORIS's TFOM metrics.

First, the onboard training record processes provide a unit's command leadership with an instant look at their current training proficiency within a multitude of areas. This allows onboard management to develop plans to improve weaker areas and reinforce stronger areas, as required, in the most efficient manner. This efficiency is achieved because plans can be drawn that focus on the weakest areas first, to ensure that the crew's most precious resource—time—is not wasted on activities that will not provide as great a marginal benefit.

Second, the inspection certification processes are now shortened because of the applications that TORIS handles. Shortening the time spent on inspections is critical to getting ships approved for deployment quicker, which assists the TYCOMs' efforts to meet the 6 + 2 goal.

Finally, the automatic population of DRRS-N via TORIS's TFOM metrics is the last action that TORIS takes to support the war-fighting capability of the force:

> DRRS-N provides the unique ability to ascertain and report to the Office of the Secretary of Defense (OSD) the readiness level of any Navy unit, so that critical decisions can be made to deploy units in a timely manner based on accurate, up-to-date information. (Innova Systems International, 2009)

TORIS, therefore, populates the training data required by DRRS-N so that TYCOMs and OSD receive current data on the training readiness of the fleet.

3. Technical Requirements

While TORIS is a hardware and software information technology system, it is software intensive. This is because it is essentially a suite of software systems, bundled together in one user interface, managed by four hardware servers. The complexity of the system grows as the interaction between the software systems increase, thus forcing TORIS system developers to actively perform design functions that support system agility.

The system begins with the end users, who populate their ship's training data or inspection records on laptop computers, tablet personal computers, or the ship's LAN computers. The laptops and tablets are preinstalled with remote software, so that individuals can record data without Internet connectivity, if required. Later, individuals connect to https://toris.atgpac.nmci.navy.mil/wrapper/default.aspx and upload their data. Any standard browser can be used to access, but users must authenticate via public key infrastructure (PKI). The system is programmed to operate within IT-21 (Afloat) and NMCI (Shore) environments.

The data flows via unclassified but 128-bit secure socket layer to the system server array, see Figure 6. Two application and two database servers compose the server array. All four are located onboard Naval Base Coronado, Naval Air Station North Island installation, Grace Hopper Building. The application servers utilize ASP.Net programming. The database servers are managed by Microsoft SQL Server 2000/2005 software.

Upon collection and storage of the data, the system can then respond to user requests for information. One type of user request is Web-based, and it allows authorized

users to investigate specific analysis tools, such as TFOM, to gauge training readiness and conduct planning for follow-on activities. The second type of request is an extensible markup language (XML) query from other information systems and commands. This data flow of various metrics and reports is automated, and it feeds systems such as the Navy Training Information Management System, (NTIMS), DRRS-N, and required reports for the CLASSRONs. TORIS is able to conduct these processes because it "is the authoritative data source for crew proficiency and certification data for all surface forces" (Commander, Naval Surface Forces, 2008d). Its Department of the Navy Application and Database Management System (DADMS) information is current, which is important as DADMS is the official DoN record for all authoritative data sources throughout the Department. Additionally, TORIS is in possession of a current Authority to Operate (ATO). Finally, since it contains Personally Identifiable Information (PII), system administrators maintain sufficient Privacy Act requirements.

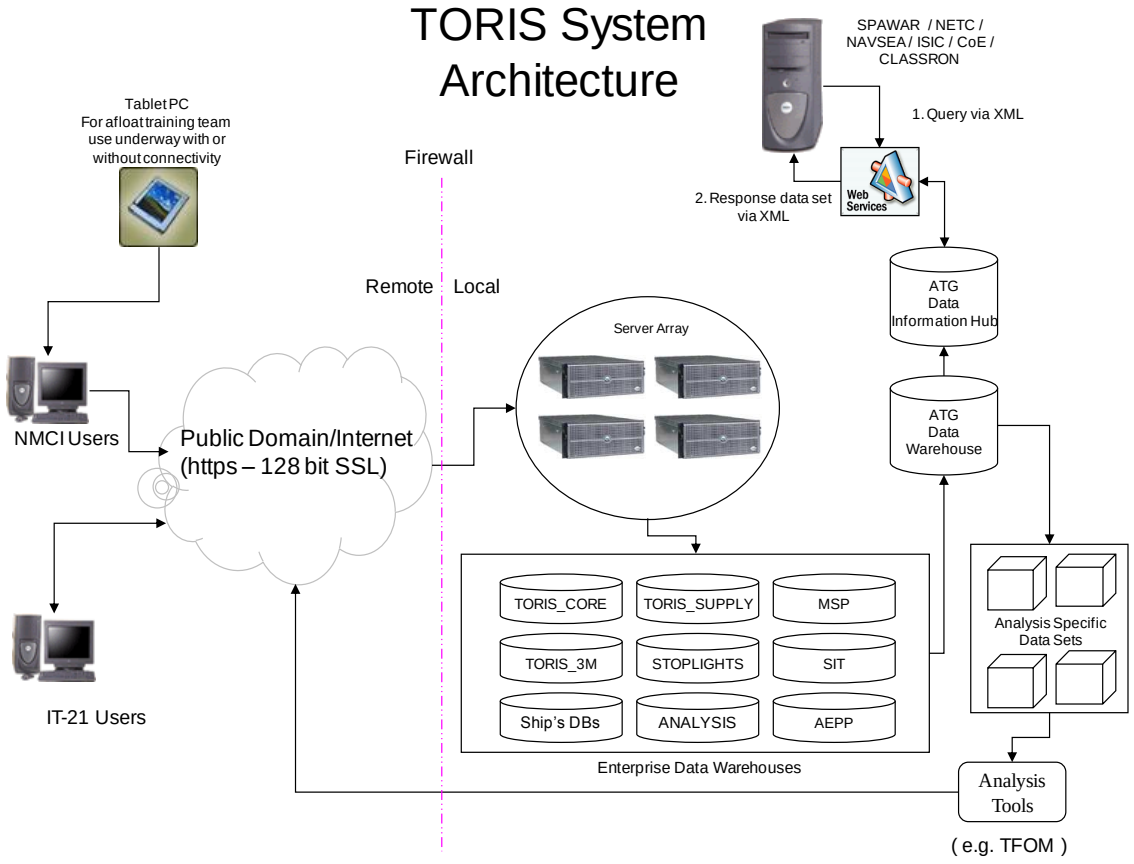


Figure 6. TORIS System Architecture (Commander, Naval Surface Forces, 2008d)

4. System Description

As CNSF and the ATGs updated the Surface Force Training Manual (SFTM), TORIS system developers responded by increasing functionality to the system. Current applications, as depicted in Figure 7, included within the TORIS enterprise system include:

- TORIS-Core: The central data collection application used by ATGs.
- TORIS-Afloat: The data collection application used by ship's company and ISICs. This system is deployed throughout the Surface Fleet.
- Training Figure of Merit (TFOM): The Commanding Officer's tool utilized to monitor training readiness. This system is a lens deployed within TORIS-Afloat and is a view within the Fleet Views.
- Fleet Views: A consolidated view of all data returned from the fleet that includes TFOM views for each afloat unit.
- Unit Level Training Status (Stoplights): CNSF's authoritative data source for ship certifications status across all mission areas assigned by the SFTM.
- Strike Group Matrix (SGM): The authoritative data source for ship certification dates across all mission areas assigned by the SFTM.
- Master Scheduling Program (MSP): ATG's tool for scheduling training missions and assigned personnel, collection and display of manpower expenditure data.
- Ships in Training (SIT): ATG's tool for monitoring ship's Unit Level Phase training progress towards obtaining or maintaining certification during ULTRA-C, ULTRA-E, and ULTRA-S phases of the SHIPTRAIN cycle.
- TORIS-Supply: ATG's tool to conduct Supply Management Certifications per CNSFINST 5040.1.
- TORIS-3M: ATG's tool to conduct 3-M Certifications per CNSFINST 4790.13.
- ATG Enterprise Personnel Program (AEPP): ATG's Human Resource management tool. (Commander, Naval Surface Forces, 2009b)

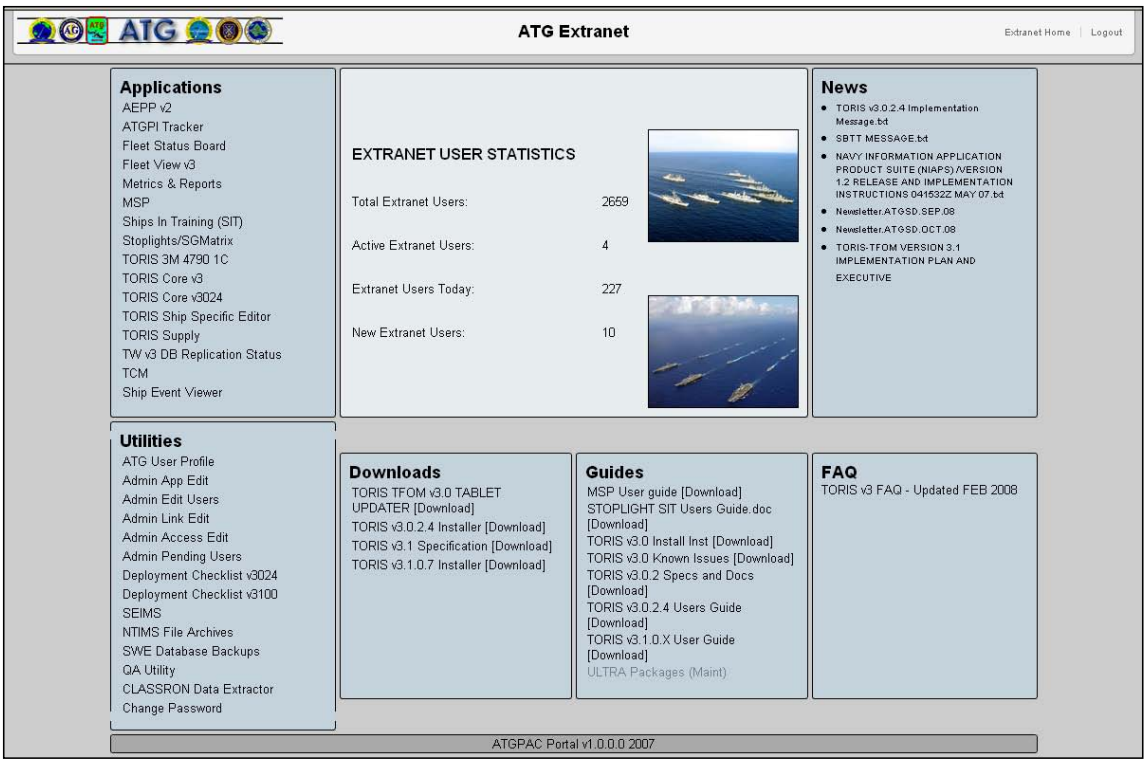


Figure 7. TORIS Portal Screenshot (Commander, Naval Surface Forces, 2008d)

The data flow of the system is extremely important, considering TORIS is essentially a data-engine—an electronic system of hardware and software that receives data as an input and conducts specified tasks on the inputs. The tasks can either be on-demand by users, such as stoplight views for ship Commanding Officers, or pre-programmed by system administrators, such as DRRS-N TFOM reporting. Figure 8 explains the primary data requests, flows, applications, and databases utilized by stakeholders.

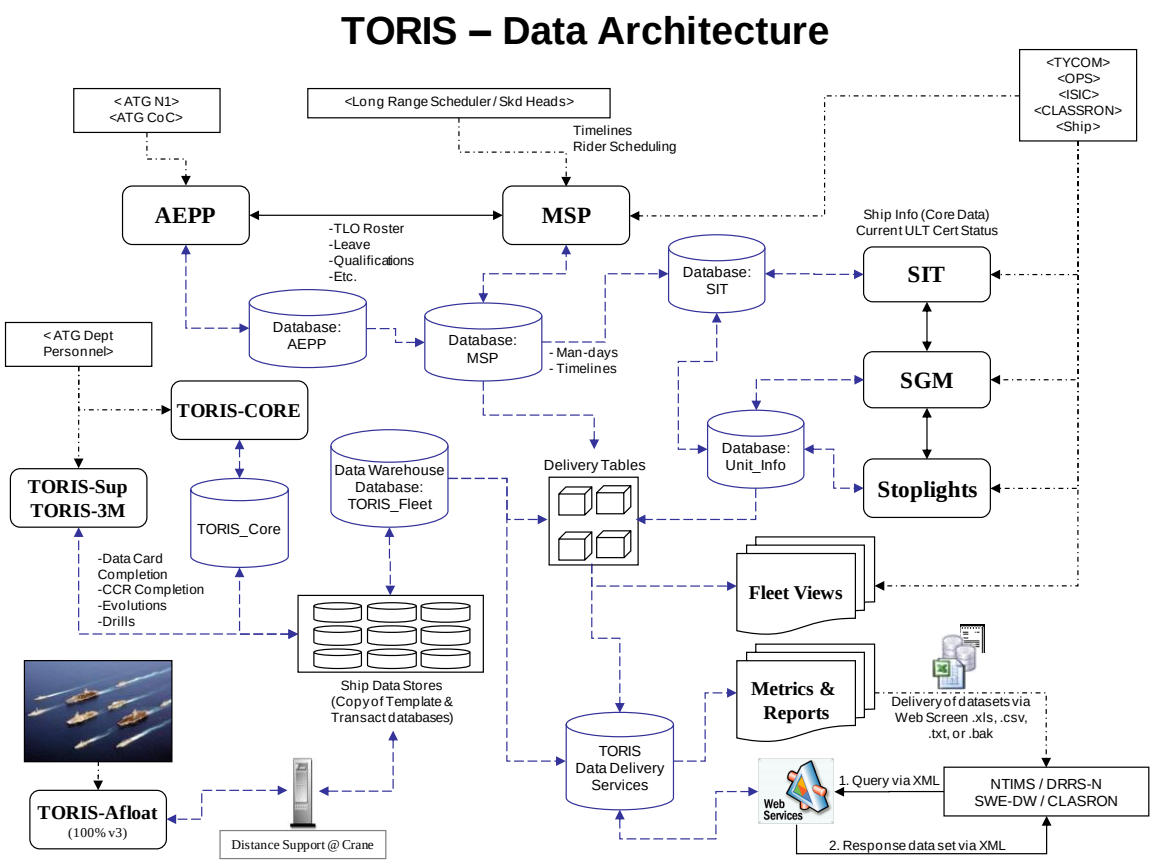


Figure 8. TORIS Data Architecture (Commander, Naval Surface Forces, 2008d)

There are over 10,000 authorized users within the system, of which over 4,000 of them were active within the past 90 days in August 2009. Shipboard users account for 3,340 of the total authorized users, representing 167 different units with approximately twenty users per vessel.

According to the TORIS system managers, the following are the primary, secondary, and tertiary areas of interest (AOI) within TORIS by echelon.

Echelon	Primary AOI	Secondary AOI	Tertiary AOI
Fleet	TORIS-Afloat	Stoplights	Fleet Views
ATG	Stoplights	Ships in Training	MSP
CLASSRON	Fleet Views	Metrics	Reports
ISIC	Stoplights	Ships in Training	Fleet Views

Table 1. Most Popular TORIS Applications by Echelon (From Stegner, 2009)

a. Contract Specifications

In 2009, the system costs were $2,303,220. The contract statement of work spells out the requirement for seven key functional areas:

- Functional Business Analysis: to provide process improvement and return on investment solutions for ATG
- Integration: to provide the software design and engineering required to support the interoperability of TORIS with external information systems
- Configuration Management/Quality Control: to provide the testing and assurance that users' needs are met and DoD information technology requirements are satisfied
- Database Management/System Administration: to develop the database while managing the authorized user list
- User Training Services: to train afloat and ATG users on and develops training documentation on all system changes
- Fleet Hardware Procurement/Distribution and Software Installation: to manage the hardware and software install at ATG and afloat locations
- Help Desk Management and Documentation: to run the TORIS help desk to field trouble calls

The statement of work also calls for the following twenty personnel positions to be provided by the contractor:

- One Program Manager/Chief Engineer
- Two Senior Software Engineers

- Three Mid-Grade Software Engineers
- Three Junior Software Engineers/Hardware Technicians
- One Senior Quality Assurance Engineer/Systems Analyst
- One part-time Senior Accreditation Specialist
- One Database Architect/Data Quality Engineer
- One Technical Documentation Specialist/Quality Assurance Test Engineer
- One Junior Subject Matter Expert/Data/Systems Analyst
- Three Mid-Grade Subject Matter Experts/Data/Systems Analysts
- One Senior Subject Matter Experts/Data/Systems Analyst
- Two SWE Senior Grade Subject Matter Experts/Data/System Analysts (Fleet and Industrial Supply Center—San Diego, 2008)

5. Summary

TORIS, a $2.3 million per year program, directly supports Fleet training readiness. It does this by transmitting and displaying key training data to commanders afloat and planners ashore to improve the surface force's ability to meet the readiness demands of the Navy's Fleet Response Plan.

B. CONTINUOUS MONITORING PROGRAM (CMP)

CMP is a software and hardware system that transmits precise and current supply and financial management data to and from ships, submarines under the purview of CNSF, and shore establishments. Its goal is to improve readiness while reducing man-hours by automating key data draw-downs and tedious manual data entry.

1. System Background

As originally conceived in 1998, CMP was planned as an information system that would provide two solutions to the Fleet. First, it was designed to act as a management tool for shipboard Supply Department personnel to quickly identify specific discrepancies within the Stores Division (S1) and the Food Service Division (S2). It was hoped that follow-on investigation by ships' crews would not only correct the discrepancies, but also would lead management to discover the origin of the discrepancy. Upon discovery of the

root cause, Supply Department leadership could repair faulty shipboard procedures and conduct workplace training in order to reduce the chances of future failures.

Additionally, off hull, CMP was designed to provide a quick and effective means of evaluation of the current Supply Department readiness of individual hulls, squadrons, and classes. The CMP data submission allowed supervisors on shore remote access to the readiness and overall health of the Supply Department. It also could be run by onboard inspectors and support teams as a means of either conducting or preparing for an official naval inspection.

The system was initially drawn up by CINCLANTFLT staff in 1998 for installation on all Atlantic Fleet surface ships and submarines. Those ships received the program in 1999 and 2000. Following in the East Coast's footsteps, the Pacific Fleet mandated its use for West Coast surface ships and submarines. In 2001, the installation of CMP was complete for the Pacific Fleet.

In 2003, the program was improved to include additional financial reporting data from various Supply Department Divisions, in order to provide a more complete snapshot of the financial status of the fleet to the TYCOM comptrollers and N41 staffs. In particular, financial reporting was enhanced to provide specific Budget Operating Target Report (BOR) data from S1 Division, port cost information, some Disbursing (S-4) data, additional food service information, fuel data, and information from Retail Sales division (S-3) would be captured (Commander, Naval Surface Forces, 2008a).

2. Mission Need

The primary mission need of CMP is fleet readiness. It supports this goal because of the way that it is designed to bring attention to potential supply department deficiencies, which could degrade into significant problem areas for ships in training or on deployment. CMP is designed to support this goal in the following approach. First, the N41 code of both the surface and submarine TYCOMs assess their fleets. They develop shipboard supply department policy that is designed to set individual ships' supply departments up for success, and thus improve ship readiness.

For example, once a piece of equipment fails onboard a ship, troubleshooting occurs to determine the source of failure and the best method for repair. If a replacement part is required, the supply department will be contacted for action. The part can either be located onboard in ship's stock or stored off hull at a repair part warehouse. If the part is not onboard, a direct turnover requisition must be generated and routed via military standard requisitioning and issue procedures through the supply system for sourcing. Once sourcing is determined, the piece part is shipped to the unit's designated location. At that time, supply personnel receive the part and immediately provide it to the respective division's repair parts petty officer.

Unfortunately, mistakes lead requisitions to delay in suspense indefinitely until discovered and restored by ship's force. Theoretically, a suspended requisition could be delayed ad infinitum, thereby preventing the original broken piece of equipment from ever being repaired.

Since this set of procedures can occur multiple times in a single day onboard afloat units, and since any number of requisitions may be in suspense at any one time, TYCOM N41 staffs developed specific policies regarding the validity of shipboard parts requisitions. If the percentage of invalid supply department requisitions increases above the TYCOM standard, then the S1 division is in violation of established force policies, and it would fail the applicable inspection criteria. CMP, which possesses the ability to scan all S1 records in a matter of minutes identifies and counts the number of invalid requisitions, can therefore improve ship's readiness by enforcing policies through minimal intervention by allowing drill-down capability of those specific pulse-point violations.

The efficient and effective nature of the system has the added benefit of reducing man-hours spent, either onboard or on shore, analyzing ship's current data for trouble spots. The automation process provides data in minutes as opposed to two weeks, as estimated by system developers (Commander, Naval Surface Forces, 2008a).

CMP supports fleet readiness by drawing down data, called pulse points, from other supply department information systems, such as R-Supply, Micro-Snap, Food

Service Management (FSM), and ROM-II, and comparing that data against Fleet standards to highlight problematic areas before significant issues can arise.

The total list of CMP S-1 pulse points are as follows:

- Automatic Reorder Restriction Code (ARRC): Displays stock records containing an ARRC and/or a limit flag. These can be reviewed for accuracy.
- AT6 Count: Number of excess line items onboard.
- Average AT6 Dollar Amount: Average dollar value of excess material onboard.
- Depot Level Repairable (DLR) Carcass Charges: Current fiscal year DLR carcass charges, including surveys, expressed as a percentage of DLR obligations.
- DLR, Prior Fiscal Year: Prior fiscal year DLR carcass charges, including surveys, expressed as a percentage of DLR obligations.
- Stock Record File Maintenance: The number of stock records having invalid data, e.g., on hand balance with no location.
- Gross Effectiveness: For current month and a four-month average.
- Net Effectiveness: For current month and a four-month average.
- Range: Percent of allowed items with at least one on hand.
- Depth: Percent of allowed items having on hand equal to or greater than the established requisitioning objective.
- Material Outstanding File (MOF) Maintenance: Percent of requisitions in the MOF with valid status.
- Internal Material Obligation Validation: Percent of requisitions in the MOF having an open Job Sequence Number.
- Reorder Review Value: The dollar value of stock items not on hand and not on order.
- Reorder Review Count: The number of stock items not on hand and not on order.
- Requirement Processing: The number of requirements over 15 days old awaiting department head approval.
- Selected Item Management (SIM) Zero Balance: The number of SIM items having zero on hand balance.

The total list of CMP S-2 pulse points are as follows:

- FSM Inventory Accuracy: The most recent inventory percentage reported within the FSM program.
- Food Service Daily Posting: The total number of days that the recordskeeper updated information within FSM.
- FSM Total Inventories Conducted: The total number of inventories conducted during the current month.
- Over/Under Issue for the Month: The dollar value measuring whether the mess is on target for its yearly allocation.
- Suppo/Food Service Officer (FSO) Audits: The total number of times the FSO conducted audits in FSM for the month.

The total list of CMP S-3 pulse points are as follows:

- Stock Turn: The quotient between the ship's store cost of sales dollar value and the current quarters opening inventory value.
- Financial Difference: The quotient between the net gains and losses from all sales outlets and bulk storerooms and the total value of sales, expressed as a percentage.
- Retail Gross Profit: The result of taking 100%—100(cost of sales for the retail outlets and snack vending / total retail sales for the same).
- Canned Gross Profit: The result of taking 100%—100(cost of sales for the canned vending machines / total retail sales for the same).
- Emblematic Percentage: The quotient between the dollar value of emblematic inventory and the total inventory dollar value. (Commander, Naval Surface Forces, n.d.)

3. Technical Requirements

All CMP equipment, data, and software is government owned and contractor operated. The CMP system is composed of two primary components. The first is a software program installed in shipboard supply department computers called the extractor. It is written in Visual Basic and formatted to operate on Windows 98, 2000, and XP systems. The program contains a set of structured query language (SQL) queries, which, when run, automatically extract the required data from the applicable supply information systems. See Figure 9.

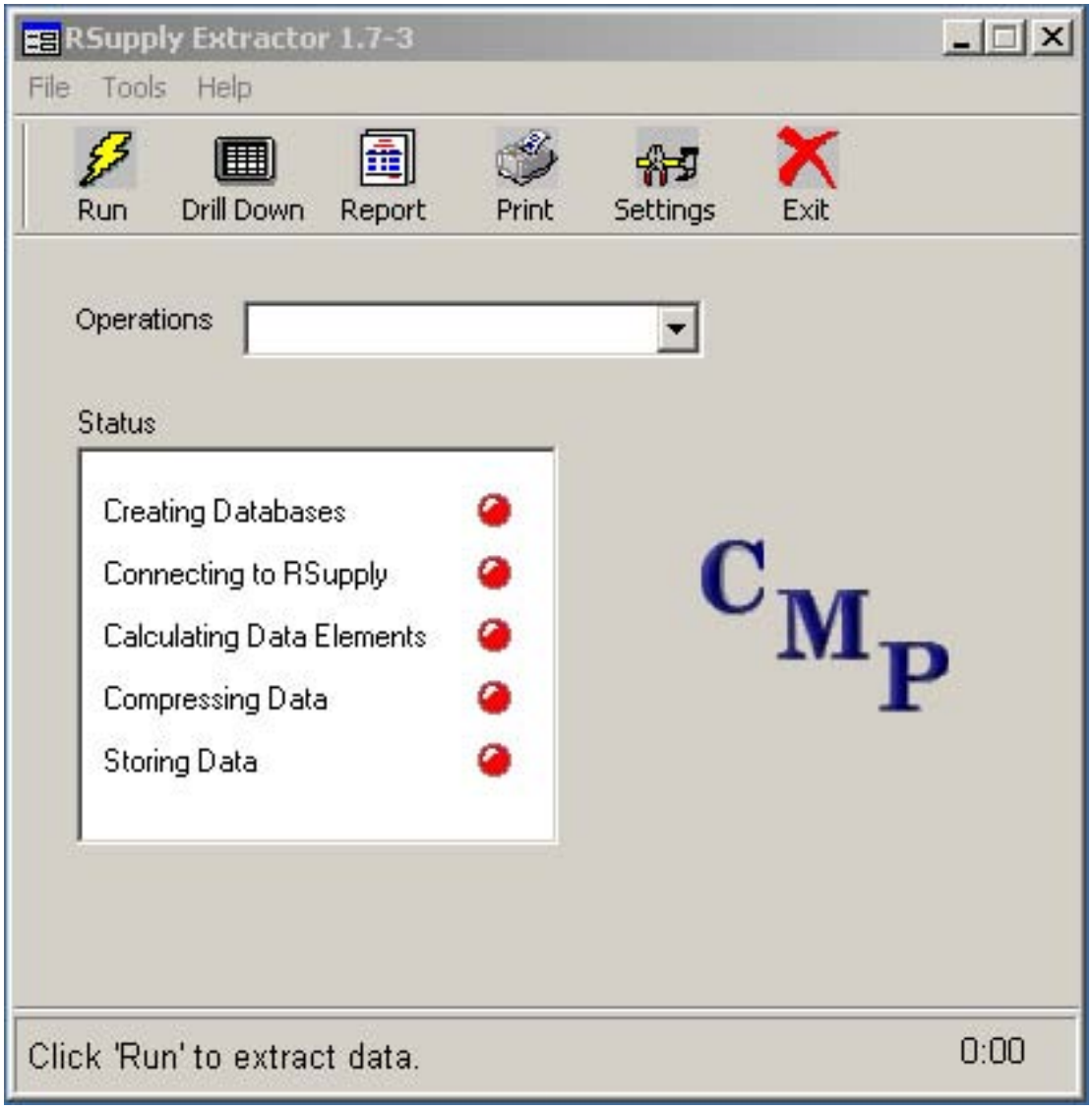
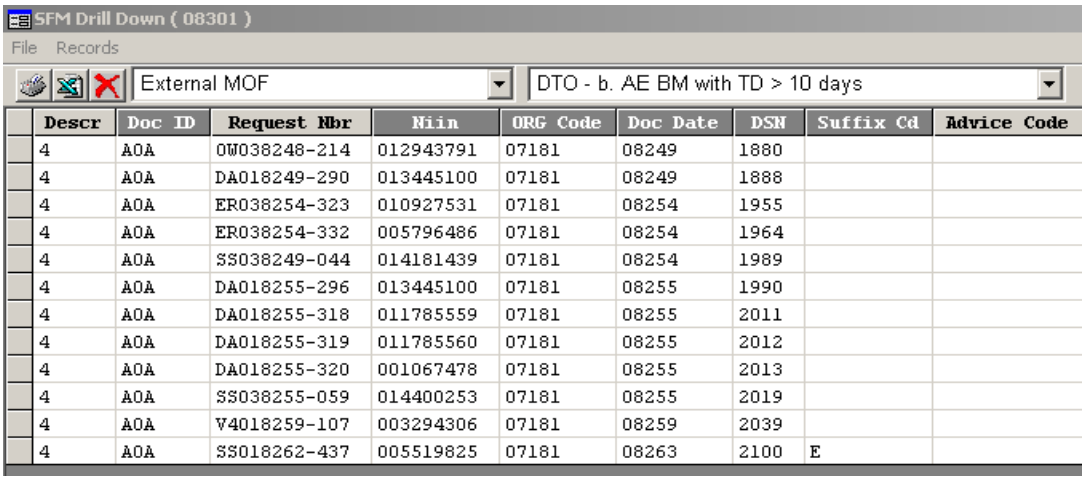


Figure 9. CMP S-1 Application (Commander, Naval Surface Forces, 2008a)

Personnel may conduct any of three events after program completion. First, they may display the results in Microsoft Excel format for easy sorting and viewing of individual records. See Figure 10. This feature is designed to provide shipboard supply departments with the precise information they need for the investigation and resolution of discrepancies.



SFM Drill Down (08301)

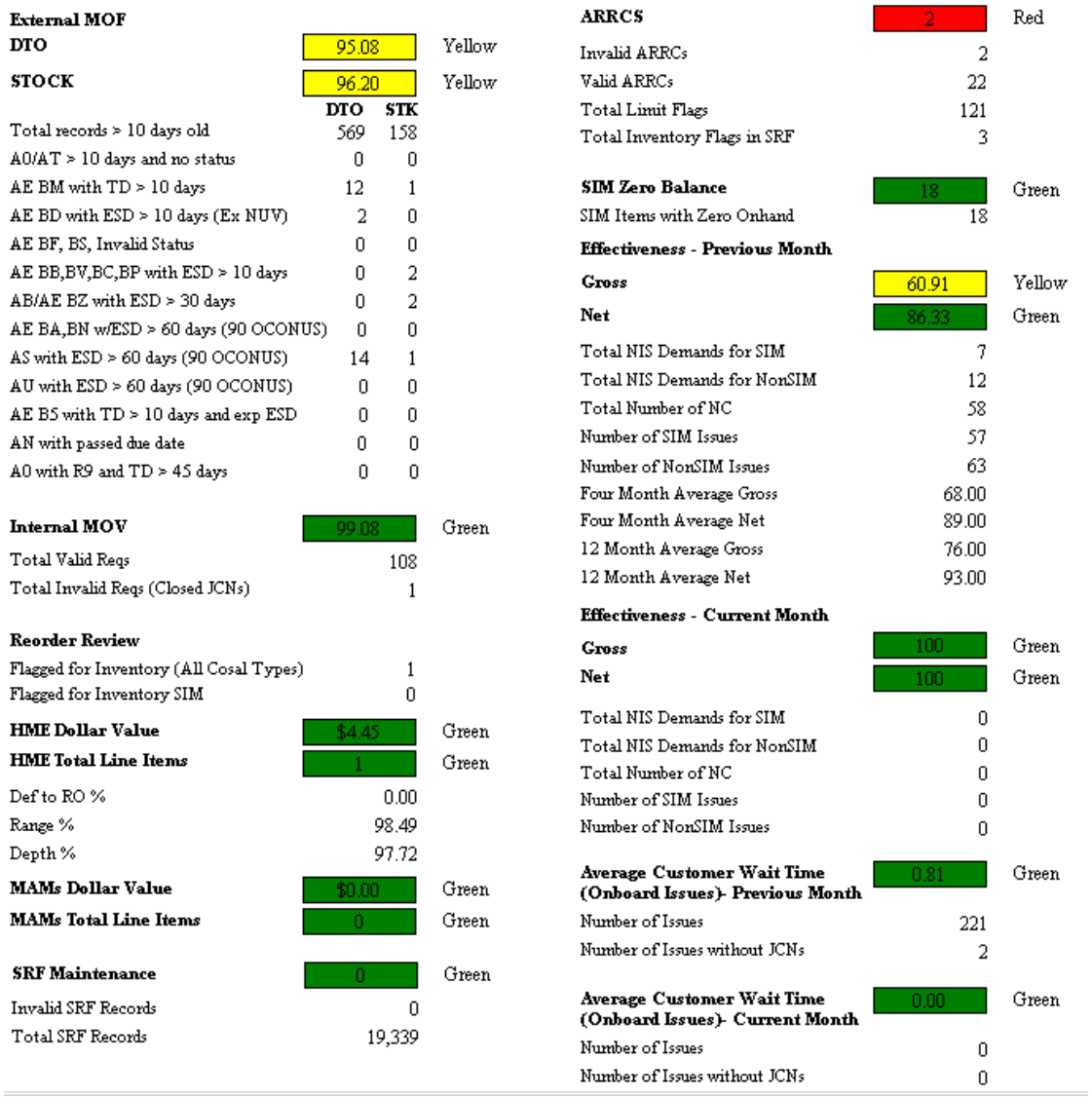
File Records

External MOF | DTO - b. AE BM with TD > 10 days

Descr	Doc ID	Request Nbr	Niin	ORG Code	Doc Date	DSN	Suffix Cd	Advice Code
4	AOA	OW038248-214	012943791	07181	08249	1880		
4	AOA	DA018249-290	013445100	07181	08249	1888		
4	AOA	ER038254-323	010927531	07181	08254	1955		
4	AOA	ER038254-332	005796486	07181	08254	1964		
4	AOA	SS038249-044	014181439	07181	08254	1989		
4	AOA	DA018255-296	013445100	07181	08255	1990		
4	AOA	DA018255-318	011785559	07181	08255	2011		
4	AOA	DA018255-319	011785560	07181	08255	2012		
4	AOA	DA018255-320	001067478	07181	08255	2013		
4	AOA	SS038255-059	014400253	07181	08255	2019		
4	AOA	V4018259-107	003294306	07181	08259	2039		
4	AOA	SS018262-437	005519825	07181	08263	2100	E	

Figure 10. CMP S-1 Pulse Point Data Drill Down (Commander, Naval Surface Forces, 2008a)

Second, users may print out a management report, which provides traffic light results, of green or acceptable, yellow or warning, and red for unsatisfactory. See Figures 11, 12, and 13 for S-1, S-2, and S-3, respectively. Primarily, this function is to aid command and squadron leadership to quickly survey the health of the department.



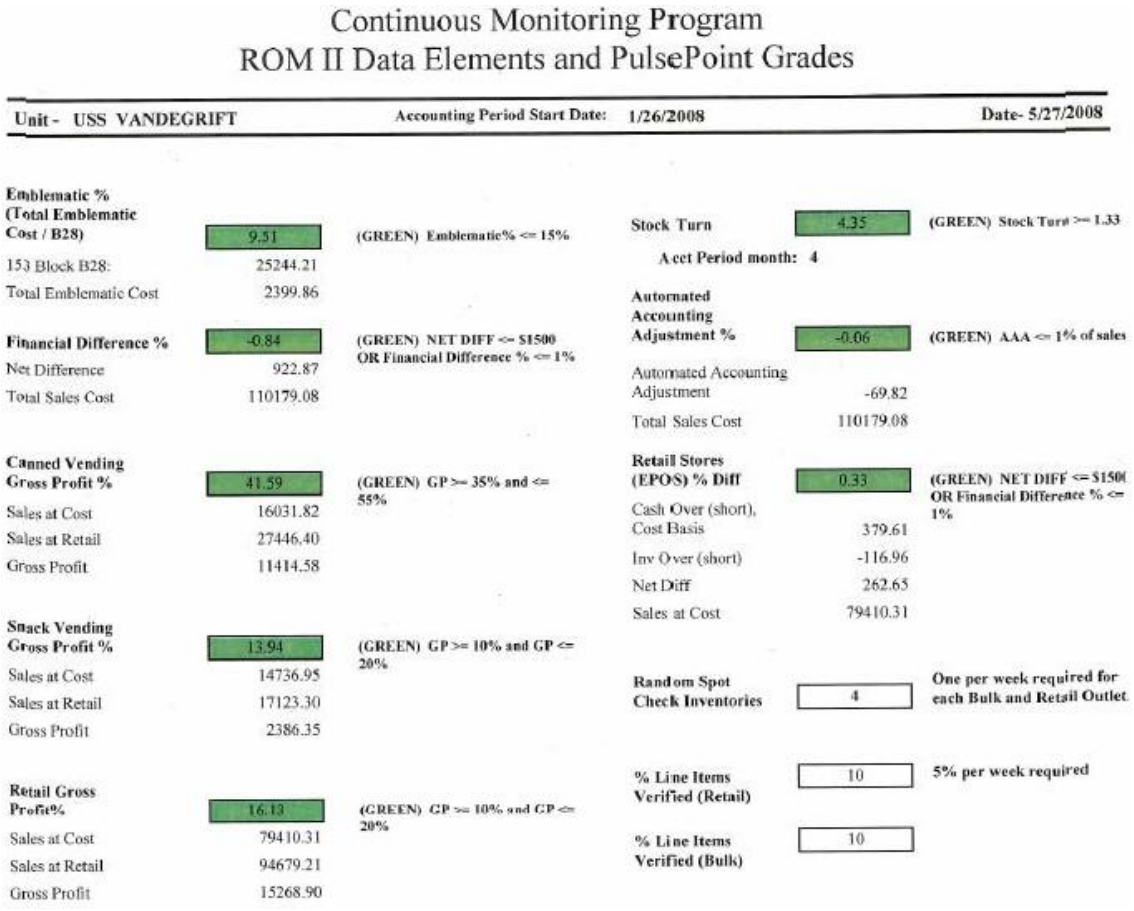
External MOF			
DTO	95.08		Yellow
STOCK	96.20		Yellow
	DTO	**STK**	
Total records > 10 days old	569	158	
A0/AT > 10 days and no status	0	0	
AE BM with TD > 10 days	12	1	
AE BD with ESD > 10 days (Ex NUV)	2	0	
AE BF, BS, Invalid Status	0	0	
AE BB,BV,BC,BP with ESD > 10 days	0	2	
AB/AE BZ with ESD > 30 days	0	2	
AE BA,BN w/ESD > 60 days (90 OCONUS)	0	0	
AS with ESD > 60 days (90 OCONUS)	14	1	
AU with ESD > 60 days (90 OCONUS)	0	0	
AE BS with TD > 10 days and exp ESD	0	0	
AN with passed due date	0	0	
A0 with R9 and TD > 45 days	0	0	
Internal MOV	99.08		Green
Total Valid Reqs	108		
Total Invalid Reqs (Closed JCNs)	1		
Reorder Review			
Flagged for Inventory (All Cosal Types)	1		
Flagged for Inventory SIM	0		
HME Dollar Value	$4.45		Green
HME Total Line Items	1		Green
Def to RO %	0.00		
Range %	98.49		
Depth %	97.72		
MAMs Dollar Value	$0.00		Green
MAMs Total Line Items	0		Green
SRF Maintenance	0		Green
Invalid SRF Records	0		
Total SRF Records	19,339		

ARRCS	2	Red
Invalid ARRCs	2	
Valid ARRCs	22	
Total Limit Flags	121	
Total Inventory Flags in SRF	3	
SIM Zero Balance	18	Green
SIM Items with Zero Onhand	18	
Effectiveness - Previous Month		
Gross	60.91	Yellow
Net	86.33	Green
Total NIS Demands for SIM	7	
Total NIS Demands for NonSIM	12	
Total Number of NC	58	
Number of SIM Issues	57	
Number of NonSIM Issues	63	
Four Month Average Gross	68.00	
Four Month Average Net	89.00	
12 Month Average Gross	76.00	
12 Month Average Net	93.00	
Effectiveness - Current Month		
Gross	100	Green
Net	100	Green
Total NIS Demands for SIM	0	
Total NIS Demands for NonSIM	0	
Total Number of NC	0	
Number of SIM Issues	0	
Number of NonSIM Issues	0	
Average Customer Wait Time (Onboard Issues)- Previous Month	0.81	Green
Number of Issues	221	
Number of Issues without JCNs	2	
Average Customer Wait Time (Onboard Issues)- Current Month	0.00	Green
Number of Issues	0	
Number of Issues without JCNs	0	

Figure 11. CMP S-1 Pulse Point Traffic Light Report (Commander, Naval Surface Forces, 2008a)

Daily Posting	2.07	Green
Records Posting	15	
Days Mess Open	31	
Inventory Accuracy	100.00%	Green
Inv Adjusted	0	
Inv Total	63	
Inventory Adjustment	0.00%	Green
Value of Items Inventoried	$313,164.26	
Value Adjustment	$0.00	
Endurance	34.32	Yellow
Days Food OnBoard	34.32	
Number Assigned	917	
BDFA	$9.95	
Over and Under Issue	18.58%	Red
Total Food Cost	$69,180.72	
Total Allowances	$84,967.36	
Days Mess Open	31	
Days At Sea	16	
Supply Officer Audits	3	Yellow
Audits	3	
Days Since Last Wall to Wall	39	Green
Meal Acceptability	72.25%	Red
Acceptability Posted	1109	
Total Meals	1535	

Figure 12. CMP S-2 Pulse Point Traffic Light Report (Commander, Naval Surface Forces)



Continuous Monitoring Program
ROM II Data Elements and PulsePoint Grades

Unit - USS VANDEGRIFT		Accounting Period Start Date: 1/26/2008		Date- 5/27/2008
Emblematic % (Total Emblematic Cost / B28)	9.51	(GREEN) Emblematic% <= 15%	**Stock Turn**	4.35	(GREEN) Stock Turn >= 1.33
153 Block B28:	25244.21		Acct Period month: 4		
Total Emblematic Cost	2399.86				
Financial Difference %	-0.84	(GREEN) NET DIFF <= $1500 OR Financial Difference % <= 1%	**Automated Accounting Adjustment %**	-0.06	(GREEN) AAA <= 1% of sales
Net Difference	922.87		Automated Accounting Adjustment	-69.82	
Total Sales Cost	110179.08		Total Sales Cost	110179.08	
Canned Vending Gross Profit %	41.59	(GREEN) GP >= 35% and <= 55%	**Retail Stores (EPOS) % Diff**	0.33	(GREEN) NET DIFF <= $150(OR Financial Difference % <= 1%
Sales at Cost	16031.82		Cash Over (short), Cost Basis	379.61	
Sales at Retail	27446.40		Inv Over (short)	-116.96	
Gross Profit	11414.58		Net Diff	262.65	
			Sales at Cost	79410.31	
Snack Vending Gross Profit %	13.94	(GREEN) GP >= 10% and GP <= 20%			
Sales at Cost	14736.95		**Random Spot Check Inventories**	4	One per week required for each Bulk and Retail Outlet
Sales at Retail	17123.30				
Gross Profit	2386.35				
			% Line Items Verified (Retail)	10	5% per week required
Retail Gross Profit%	16.13	(GREEN) GP >= 10% and GP <= 20%			
Sales at Cost	79410.31		**% Line Items Verified (Bulk)**	10	
Sales at Retail	94679.21				
Gross Profit	15268.90				

Figure 13. CMP S-3 Pulse Point Traffic Light Report (Commander, Naval Surface Forces)

Third, users are required at prescribed periodicities to save the data to file for ultimate submission via unclassified e-mail to the CMP server—the second major component of the CMP system, which receives, sorts, stores, and presents the shipboard data to authorized users at https://cmp.surfor.navy.mil. The server runs Microsoft Windows Server 2003. It stores required data via Microsoft SQL Server 2003 database software. It is composed of two parts: the data server, which is actually the CNSF Web Server located in Norfolk, Virginia, and the Web server, physically located within CNSL N6 spaces. The server uses several programming languages (e.g., ASP, XML, and PHP), to present all the results to the viewer within a Web interface. It operates within Navy/Marine Corps Intranet underneath the CNSF domain.

In addition to providing users, who are primarily from the TYCOM, CLASSRON, and ATG staffs, the server also populates several other information systems, not the least of which is DRRS-N. See Figure 14. CMP provides 95% of the required Supply Figure of Merit (SFOM) data to DRRS-N.

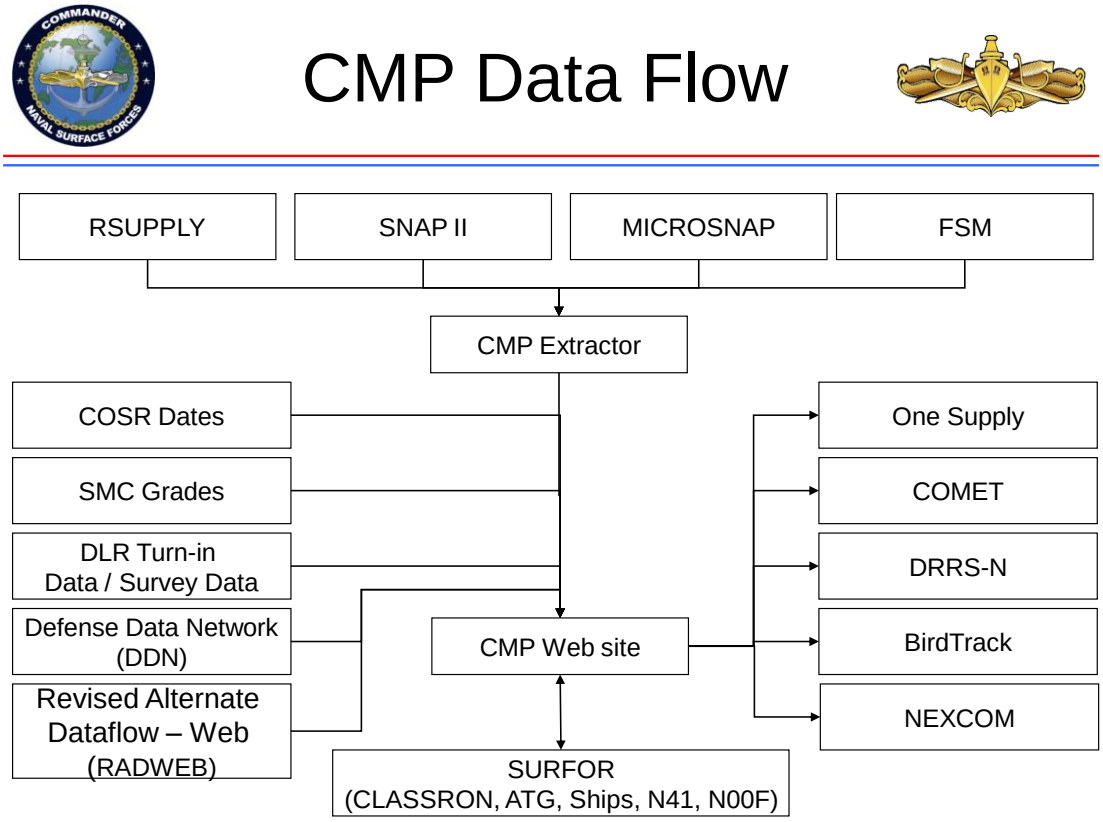


Figure 14. CMP Data Flow (Commander, Naval Surface Forces, 2008a)

Behind the scenes of CMP is the development server. It is maintained by the development team of contractors and operates on a dedicated server, which mirrors the Production Environment, while allowing for modification, testing, and evaluation.

4. System Description

CMP is managed through a continuing contract. The statement of work explicitly calls for the contractor to:

> Maintain and develop requirements for SURFOR and SUBFOR Web Development and CMP working with staff personnel. Continue current

> development and programming efforts for CMP and perform administrative functions to track ongoing progress. Assist Fleet Units and Subordinate Commands in their Web Development and CMP's expansion to all fleet units. (Fleet and Industrial Supply Center—Norfolk, 2008)

Essentially, contractor tasks are devoted to two primary tasks. First, to run the engine of CMP, as is. This requires the contractor to administer the current Web server in accordance with customer demands, to troubleshoot and maintain both the Web server and the shipboard extractor, to provide training to end users, and to collect and disseminate desired management data.

Second, the contractor is responsible for future development of the system to meet emerging requirements. This is a prominent function of the system managers considering that several major functions have been added to the original template and several more are currently under development. For example, new production tools allow for TYCOM comptrollers to grant, augment, and advance units' Operating Targets (OPTARs) or ship's budgets. Also, expanded DLR carcass tracking functionality provides improved communications up and down the chain of command in order to limit unnecessary costs.

The Fiscal Year 2009 requirement was projected at $996,329. The statement of work also calls for the following five personnel positions to be provided by the contractor:

- One Program Manager
- One Software Application Engineer II
- One Software Application Engineer III
- One Project Control Technician
- One Web Technician II (Fleet and Industrial Supply Center—Norfolk, 2008)

The contractor satisfies this by providing five full-time programmers, with one out of the five dedicated to submarine force CMP development.

5. Summary

CMP, a $1 million per year program, improves Fleet readiness, while reducing man-hours spent on tedious data entry and analysis. It does this by transmitting key logistics data from the Fleet to shore leadership to ensure that the staff objectives are continually met.

C. CNSF WEB

CNSF Web is a knowledge management system. It "provides CNSF and its ships and subordinate commands (afloat and ashore) with a secure, centralized, content-driven, integrated web-based collaboration system" (Commander, Naval Surface Forces, 2008e).

1. System Background

The original development for CNSF Web stems from a U.S. Pacific Fleet staff knowledge management study conducted in 1999. The study found through requirements analysis processes that a government owned, Web-based, collaboration toolset to provide a central location for all organizational knowledge was desirable for mission support. Specific requirements included the ability to be searchable across domains and be both Nonsecure Internet Protocol Router Network (NIPRNet) and Secure Internet Protocol Router Network (SIPRNet) capable. In late 2000, funded by its staff budget, the CNSP Knowledge Manager established the CNSF Web, built upon the Microsoft SharePoint Portal System.

In 2004, the first consolidated CNSP and CNSL Web portal was launched. In tandem with the Navy Surface Warfare Enterprise initiative, subordinate commands were provided the option of consolidation with the CNSF Web portal.

The changes required to bring a single site together for both coasts was not without its problems. While combining the information technology support staffs was deemed effective, there remained a lack of automation within the site. This led to a period of disuse and key functional areas ignored the new portal.

In May 2005, Naval Network Warfare Command (NETWARCOM) promulgated operation CYBER Condition Zebra. Its goal was to improve the overall security of Navy

computer networks (DONCIOmemoFY06expendtiures, 05). In response, CNSF made two major shifts to the CNSF Web system. First, it absorbed into its environment several legacy CNSF information technology systems, such as CMP. Second, in 2006, it transferred to the NMCI Enterprise Network. At that time, a plan was detailed to shift CNSF Web to the CUSFFC Fleet Forces Online (FFO) Portal.

In 2007, CNSF mandated the migration of all subordinate public and private websites to its purview. This was in response to NAVADMIN 145/07, which stated its objectives to "move the navy toward a single investment strategy for websites, provide enhanced website information assurance and accountability, and establish Navy website standardization and branding" (NAVADMIN, 2007).

NETWARCOM then accredited CNSF Web NIPRNet with the Authority to Operate (ATO) in July 2008. Currently, CNSF Web SIPRNet is awaiting Interim Authority to Operate from its certifying authority.

2. Mission Need

The primary mission support function of the CNSF Web is force alignment. It does so by linking the primary staff functions of all echelons within the chain of command, from the deckplate level to the Commander, Naval Surface Forces, in one electronic location. It does so by providing the resource for staffs to publish policies and directives, follow various operational metrics, and communicate with each other on pertinent topics.

In addition, it is the primary tool utilized by CNSF to meet the CNO's FORCEnet, "Alignment" and Sea Enterprise goals along with the business requirements of the Surface Forces Enterprise (SWE).

Finally, it provides a true, Enterprise solution for the claimancy. As a certified Enterprise Level Collaboration Portal, it supports the Navy Enterprise and SWE efforts to reduce inefficiencies and redundancies and leverage Enterprise systems to create cost savings for the SWE (PPT Brief Contract Consolidation).

3. Technical Requirements

Users access the CNSF Web, diagrammed in Figure 15, via any Web browser. The uniform resource locator (URL) for the publically accessible unclassified site is http://www.surfaceforces.surfor.navy.mil/default.aspx. The URL for the NIPRNet site is https://www.surfor.navy.mil/, and the classified SIPRNet URL is https://www.surfor.navy.smil.mil/.

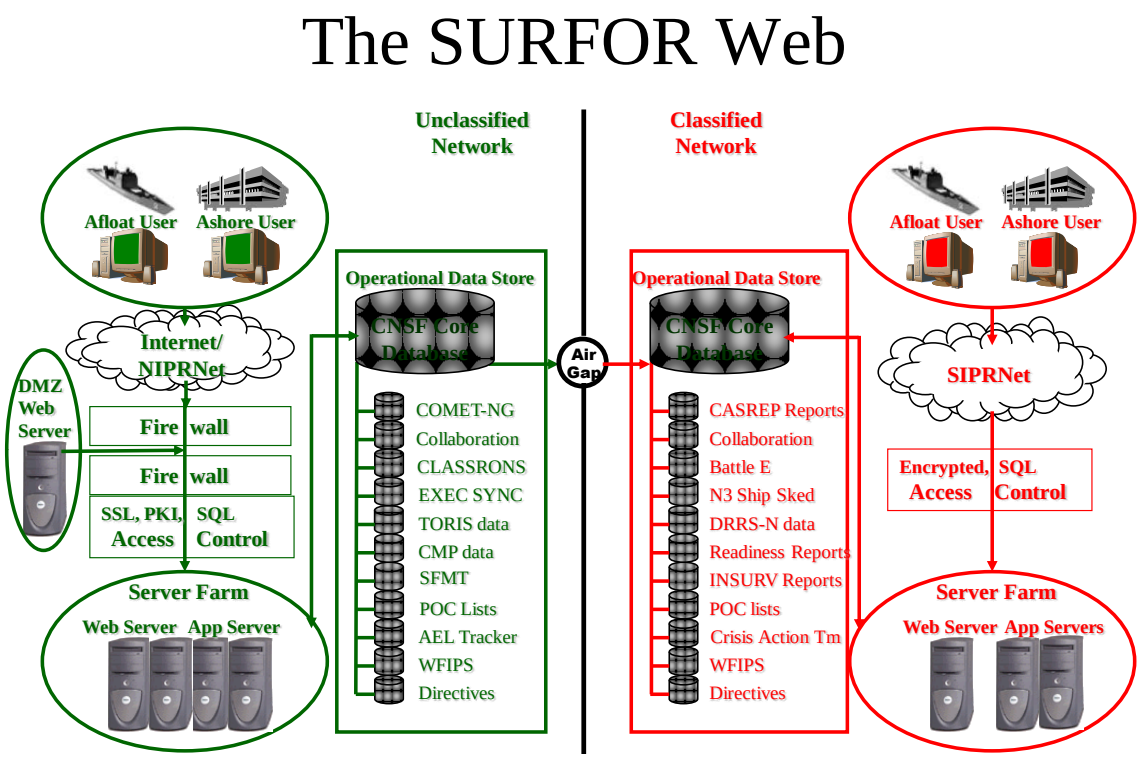


Figure 15. CNSF Web Architecture

Users accessing publically accessible Web sites, such as family support pages or Public Affairs Officer (PAO) sites, are directed to the Web servers at the NMCI DMZ facility building W143 located onboard Norfolk Naval Station.

Users wishing to access TORIS, CMP, or other unclassified data, need to clear SSL and PKI controls first. Then, they may access the web and data servers on the unclassified network. All operationally classified information is directed to the Web and

data servers on the SIPRNet. Both of these groups of servers are located in Building NH-13, also on Norfolk Naval Station (PPT Brief: SURFOR Web Overview).

4. System Description

As stated earlier, the CNSF Web provides the claimancy with a "secure, centralized, content-driven, integrated web-based collaboration system" (PPT Brief: SURFOR Web Overview). In addition to each CNSF staff department Web site, it houses all afloat command Web sites, extranets, CLASSRON, Assault Craft Unit homepages, and the Web sites for all SWE cross functional teams. All in all, there are over 4,000 site administrators distributed throughout the system.

The Web is a resource for the conduct of key CNSF business processes. Those include:

- Publicly Accessible Web sites
- Family Web sites
- Private Business Collaboration sites
- Departure From Specifications Database (DFS)
- C5 Readiness Assessment (C5RA)
- Authorized Equipment Listing Program (AEL)
- COMET II
- Hot Wash
- 2MCAL
- War Fighting Improvement Program (WFIP)
- Continuous Monitoring Program (CMP)
- ATGLANT Toolkit and Level of Knowledge Program (LOK)
- (PPT Brief: SURFOR Web Overview)

Responsibilities for the system management are divided as follows: CNSL N6 performs system engineering, network administration, database administration, and web development functions. CNSP N6 focuses on program management, Web development

strategy, and SharePoint specific functions, such as, technical architecture development, user support, and business analysis and training.

Specific contract costs for FY09 are broken out as follows:

Dollar Value	Location	Purpose	Contract Manager
$703,000	San Diego, CA	CNSF Web Support	US Army CECOM, Fort Monmouth
$703,580	Norfolk, VA	CNSF Web Support	US Army CECOM, Fort Monmouth
$672,120	Norfolk, VA	NMCI Support	US Army CECOM, Norfolk
$156,863	San Diego, CA	NMCI Support	NAVICP, Mechanicsburg
$2,235,563		TOTAL	

Table 2. CNSF Web FY09 Funding Structure

This funding structure breaks out four distinct groups within the purview of the system. First and second are the actual Web server maintenance contracts for information technology support on the West Coast and East Coast. Specific duties and responsibilities for those contracts include: hardware configuration and maintenance; software installation, modification/correction, and security; database administration and management; training in a one-on-one, webinar, and/or classroom application environment, as well as workstation end-user training. See Figure 16.

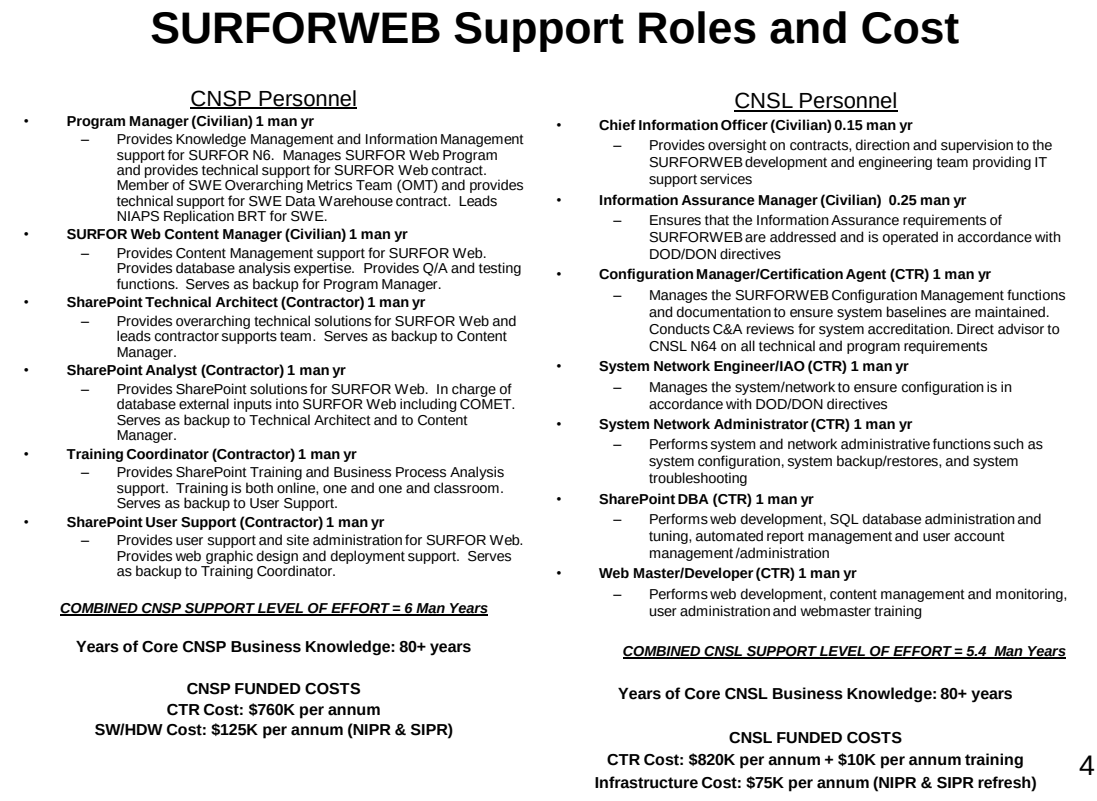


Figure 16. CNSF Web Support Roles by Coast

The third and fourth line items provide technical support for the NMCI network within the CNSF claimancy. This support includes network engineering, repair services, system analysis and technical services, computer and LAN technical support, ordering, billing, account management and inventory control of hardware and software, and information assurance process control and management, and video teleconferencing support (FY10 Budget Document Consolidated IT Support, 2009).

Recent data shows that the CNSF Web receives 373 average requests per day. From July 14 to August 13, 2009, 1,517 distinct users accessed the system. See Figure 17.

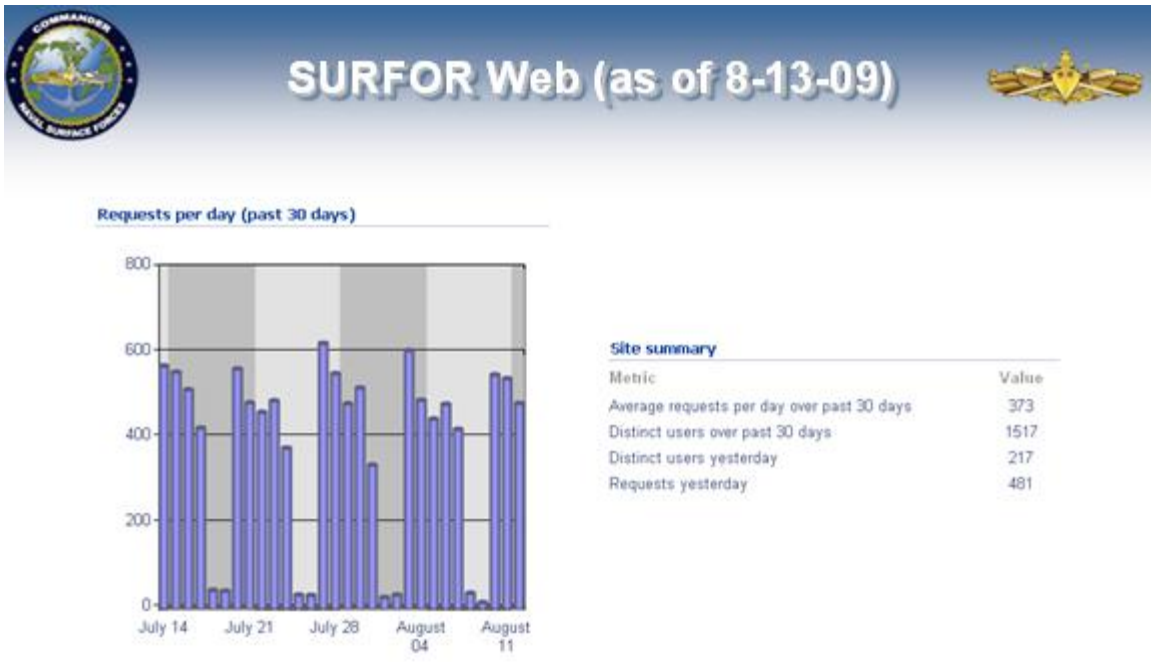


Figure 17. CNSF Web Usage Data as of August 13, 2009

5. Summary

CNSF Web, a $2.2 million per year program aligns the surface force to match the objectives set by CNSF. It accomplishes this by providing the means for all echelons of command within the organization to effectively, efficiently, and securely communicate via the Web.

D. SUMMARY

This chapter provided an objective description of the three major information systems that this project evaluates. Its data is current as of the end of Fiscal Year 2009.

IV. COMMANDER, NAVAL SURFACE FORCES (CNSF) INFORMATION SYSTEMS RESEARCH

This chapter evaluates the information technology systems on a case by case basis. It does so first by delineating the quality attributes that collectively compose a successful information system. Later, it describes the evaluation methodology that we used to review the systems. Finally, it provides a comprehensive evaluation for each information technology system, based on user feedback and Program Manager responses to our interview questions.

A. ATTRIBUTES OF A SUCCESSFUL INFORMATION SYSTEM

Unlike a simple math problem, there is no single right answer when it comes to an organization's search for an information system solution. There are a multitude of variables, both logical and physical, specialized in-house or generalized commercial off the shelf, technologically cutting edge or passed down as a legacy product, that management can choose between in its search for the best tool for the job.

However, there are a certain set of characteristics that most Department of Defense (DoD) information systems share in common. These "quality attributes," when planned for in the development phase of the system, can greatly enhance the program's ability to provide the desired solution correctly and efficiently over time. Simply put, systems exhibiting superior delivery of these traits are much more likely to make the customer happy.

It is important to note that these quality attributes can be described on a scale or range, as they can be expressed as being present to varying degrees. Like functional attributes, it is costly to improve a particular quality attribute. Therefore, organizations must build toward the desired degree of each quality attribute that is sufficient for its purposes.

The following is a breakdown of the six key, quality attributes that can be easily distinguished within the CNSF information systems.

1. Usability

Usability is the relative simplicity that end users experience in terms of every-day operation of the system. It is represented by an easy to understand, visually appealing, and intuitive interface. In addition, it should be clear to the users that the functions they are performing easily relate to the overall goal of the system itself.

2. Interoperability

Interoperability is a necessary quality attribute for the information systems handled by most large organizations such as CNSF. It describes the systems' ability to work together with other information technology systems. This is important not only because it enables the automation of data processing across platforms, but also because it makes it easier for decision makers to find and utilize the information that they need.

Generally, interoperability is described as a technical term, within a systems engineering context. In addition, it can be also used to describe the information system within the broader context of the organization's culture as a whole. For example, an organization's uses of paper requests for personnel travel-request processing and an automated, electronic financial accounting information technology system. An information system that allows for Web-based travel processing would not be considered fully interoperable simply because it feeds required data into the financial accounting system. Instead, management must ensure that personnel are using the system quickly and effectively. A culture that inhibits change to the new system restricts its interoperability.

3. Responsiveness

Responsiveness is a straightforward characteristic, but nonetheless necessary to the success of any information technology system. It relates to the speed with which it responds to user interactions. While a small percentage of systems possess a requirement for real-time data flow, the time criticality of many systems is not normally

the highest priority for management. However, failure to develop responsiveness within an information system can cause several unintended consequences, including the loss of workforce productivity.

4. Maintainability

Maintainability describes an information system's capacity for improvement and modification. Change to the system can be requested for any number of reasons, but most modifications are undergone to repair faults, satisfy successive management requirements, support subsequent maintenance efforts, or transform to interact within the latest and current environment.

5. Scalability

Scalability relates to the system's ability to support an increased workload, more users, and/or more data, in a timely fashion. The more robust the system, the more advantageous scalability is to management because it is more likely to be able to successfully provide what is required from it. In addition, an information system exhibits even better scalability when it provides for a greater workload without impacting current functions.

6. Standardization

Standardization, the final quality attribute detailed in this paper, communicates the matching of an information system's technical standards and specifications to those established by higher, legitimate, or de facto authority. In this context, the standardization of the system should match those requirements set by the DoD and the Department of the Navy (DoN) Chief Information Officers (CIOs). One example of a standard is found in DoD Instruction 8510.01, dated November 28, 2007. It dictates the necessity for DoD Components to "Operate only accredited information systems (i.e., those with current Authority to Operate (ATO), interim authorization to operate, or interim authorization to test)" (DoD 8510.01). This mandate ensures that only

information technology systems that pass an approved certification process, which reviews broad system architecture and information assurance capabilities, operate within DoD.

B. EVALUATION METHODOLOGY

The following section describes the method by which we conducted our evaluation. It details the primary reference for our review as well as the key performance indicators that we based our review upon. Finally, it explains the actual method that we used to retrieve the information necessary for this project.

1. Review of the Primary Evaluation Reference

Our primary reference for conducting the baseline assessment for information systems at CNSF was the Department of the Navy Information Technology Investment Evaluation Handbook. Originally conceived to offer components with a solid framework of questionnaires and surveys for evaluating their prospective information technology investments, it is easily adapted to our purpose of conducting a baseline assessment of installed systems. In fact, it recommends that managers continue to evaluate, at least once every three years, that their programs meet the current needs of the organization by adjusting the provided steps to better apply to the applicable review.

The reference describes that a completed review should result in the manager determining whether the program was a success or failure. The data the evaluation provides describes the program's progress of meeting its cost, schedule, and performance goals by focusing on five core concepts: Mission, Performance, Management, Financial, and Technical. The following section describes each key area in detail.

a. Mission

The mission area details the link between the system itself and the organization's overarching goals and objectives. In a resource constrained environment such as the one that CNSF is coping with today, the link between investment and strategic mission must be clear and forthright. Otherwise, the return on investment of an alternative project based on the needs of the unit would most likely be greater.

The evaluator should be sure to draw distinct correlations, or in the case of a failure, the lack thereof, between the information technology system's intended objectives and the overall needs of the organization, in our case, mission readiness and mission performance.

The recommended, primary method for the evaluation of the mission concept is through the interview of end users. This allows the reviewer to gather firsthand information on how well the system supports their specified duties and responsibilities, which are aligned with those of higher authority.

b. Performance

The performance concept is based on the review of predefined technical and functional Key Performance Indicators (KPIs). During development, these data points represent the intended, objective benefits of the system. Upon deployment of the system, the KPIs are reviewed to ensure that the system is matching or exceeding the original intended business and performance requirements established by management.

The goal of the performance review is twofold. First, it explains whether or not the system is actually effective in its original intended purpose. Second, it forms the basis for a review of the program's management team. A failure to meet KPIs is a failure on management's ability to direct the system over time.

KPIs fall under one of two different categories—functional and technical. The former evaluates the system's worth to the organization and its significance to the end users based on how well it does its job. Ideally, this category is composed of both quantitative and qualitative parameters. Technical KPIs focus on quantitative measurements of the physical capabilities of the system itself. Examples of this include latency times and the maximum number of user accounts.

Technical KPIs are important, but in and of themselves, do not provide adequate data for the evaluation. Instead, it is up to management to determine the value to the organization's mission that is represented by the technical KPIs.

c. Management

Management is the term that describes the review of the effectiveness of the system's Program Manager. Specifically, it details the development and enforcement of related directives, policies, training, and other aspects of the program administration.

A more in-depth evaluation of the management area focuses on how well the system meets applicable Department of Defense and Department of the Navy written standards and requirements.

d. Financial

The reference describes the financial concept as the section that describes the balance between the system's total cost, its benefits, and its return on investment.

Total cost, while very important, is not the only data point included in this analysis. This is because total cost does not provide a complete comparison between programs. Instead, the differences between the actual benefits, both tangible and intangible, realized by the organization should be compared as well. For example, a prospective single, information system with a $6 million total ownership cost may promise to replace two legacy systems, which combine to cost $5 million and fail to communicate with each other. Considering cost alone, the replacement proposal would fail. However, if one considered the productivity increase that would present itself by replacing the legacy systems with one cohesive system, management would be more likely to approve the change. Therefore, it is essential that the review includes the relation between total cost and the system's mission contributions.

e. Technical

This area determines the technical effectiveness of the system. It does so by analyzing user feedback and test results of actual system performance. The goal is to conclude whether the operational readiness of the system is satisfactory or not.

2. Actual Interview

Specifically, for this research, we conducted two types of interviews. First, we met with representatives from each specific system's management to gain an understanding on the objectives, workings, and overhead related to each program. Second, we interviewed end users, above the shipboard level. This set of interviews was designed to understand what day-to-day impacts each system had on its customer.

C. FINDINGS AND FEEDBACK

This section provides three pieces of information on each information technology system. First, it discusses the information we received from the program manager's of each system in terms of the five core concepts contained within the Department of the Navy's Information Technology Investment Evaluation Handbook. Second, it describes the user feedback that we received.

1. Training and Operational Readiness Information Services (TORIS)

a. Program Manager Research

Despite TORIS's emphasis on training vice an operational focus, it still meets the objectives for mission improvement because it satisfactorily supports the continuous training requirements established by SHIPTRAIN. This reduces the shipboard readiness "bathtub effect" experienced when ramp down of readiness coming off of deployment is followed by the re-training and ramp up leading into a subsequent deployment. In addition, that improves CNSF's ability to meet its deployment requirements as designated by Commander, U.S. Fleet Forces Command's (CUSFFC) 6+2 plan. However, the only real productivity improvements are administrative in nature, as the system automates much of the tedious data collection, tracking, and reporting requirements up the chain of command. Despite this fact, due to the maturity of the program, it sufficiently supports the Surface Force Training Manual (SFTM) requirements.

Unfortunately, there are no contractual key performance indicators for this program, other than the few requirements built into the contract statement of work and

listed in Chapter III, used to measure either the system or the contractor's performance. This weakness will be addressed in Chapter V.

Since the casualty of the system will not preclude a ship's ability to get underway, it is considered mission enhancing for afloat units. However, it is mission critical for afloat units' training programs, as the use of TORIS is required by the SFTM. In addition, it is critical to the mission of the Afloat Training Groups (ATGs), who use it extensively in order to train and certify the Fleet as ready to deploy.

TORIS is not an official program of record, and changes to the system are handled by a strict process. First, proposed changes are vetted through a Configuration Control Group that is composed of the ATG Commanding Officers, the CNSF Assistant N7, and the CNSL Assistant N7. Then, all changes recommended for approval are routed to a Configuration Control Board for a final decision. The Squadron Commodores, CNSF N7, and the CNSL N7 collectively sit that board.

There are no financial goals established for this program, which is a weakness that could be possibly addressed in terms of return on investment.

Finally, the system's information technology infrastructure does not present any significant performance issues that require immediate attention. However, over time, as the size of the databases expand, so does its requirements for storage. Developers estimate that within two years, they will be forced to delete the oldest archived data to prevent the system from falling into partial mission capability. This is because the current database servers each possess only 500GB of hard drive space. A possible improvement would be to shift to a Storage Area Network (SAN) solution.

No formal end-user training program is in place for TORIS, although the training of new ATG staff personnel is administered as required. A unified training program between the coasts, conducted or managed by the User Training Services requirement within the contract's statement of work, would resolve this concern.

Finally, system developers report zero remaining redundancies within the system based on the merger between the East Coast and West Coast staffs.

b. User Feedback

The following tables capture the User Survey results for TORIS. The quantitative number of responses received was adequate based on the numbers of surveys that were distributed by ATG. The survey responses received were from senior enlisted Active Duty military members.

	Very Important	Important	Somewhat Important	Not Important	N/A	Very Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	N/A
1. Ease of access to system into the collection devices.	12	11	1			1	19	3	1	
2. Ease of access into the ships system or to pass to the TLO.	11	13				5	13	4	2	
3. Is the TORIS system installed on the laptops easy to use?	11	11	2			3	14	5		2
4. Is the MSP system installed on the Extranet easy to use.	14	8	2			2	14	3	3	2
5. Have confidence that the system is working correctly.	14	7	3			3	12	8	1	
6. Degree to make input for changes to the system.	12	8	1		3	1	9	6	4	4
7. Collection device is current.	10	11			3	4	15	2	1	2
8. Software installed on your computer is the most recent.	16	8				11	12	1		
9. Does your system operate well with the ships IT21 system?	7	5		1	11	4	7	2		11
10. Is the time to enter data cards into your system minimum?	12	9	3			1	13	7	3	
11. Are there contingency procedures when your computer is down?	12	11			1	1	11	7	3	2
12. Are there contingency procedures when the TLO's system is not working?	9	9	2	2	2	1	9	8	3	3
13. Is the system responsive to changing user needs?	10	12	2			3	6	7	8	
14. Does the system produce professional reports?	9	14	1			4	10	7	3	
15. Are the report data accurate?	13	11				3	10	5	6	
16. Fast response time from helpdesk to remedy issues?	13	7			4	6	8	5		5
17. Positive attitude from Help Desk to users.	12	6	3		3	8	9	2	1	4
18. Fast response time from Help Desk staff to remedy problems.	12	6	3		3	8	7	5	4	
19. System's ability to improve users' personal productivity.	12	8	3		1	3	14	4	2	1
20. Extent of user training.	14	7	3			2	11	8	3	
21. System's ability to enhance the learning experience of the user.	8	12	4			1	12	10	1	
22. Documentation to support user training is provided.	10	9	2	3			10	9	3	2
23. System enhances warfighter readiness.	12	7	4		1	2	9	7	5	1
24. System provides tangible financial benefit.	7	8	1	2	6	1	11	6	2	4

Table 3. TORIS User Feedback Numerical Responses

	Very Important	Important	Somewhat Important	Not Important	N/A	Very Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	N/A
1. Ease of access to system into the collection devices.	50%	46%	4%	0%	0%	4%	79%	13%	4%	0 %
2. Ease of access into the ships system or to pass to the TLO.	46%	54%	0%	0%	0%	21%	54%	17%	8%	0 %
3. Is the TORIS system installed on the laptops easy to use?	46%	46%	8%	0%	0%	13%	58%	21%	0%	8 %
4. Is the MSP system installed on the Extranet easy to use.	58%	33%	8%	0%	0%	8%	58%	13%	13 %	8 %
5. Have confidence that the system is working correctly.	58%	29%	13%	0%	0%	13%	50%	33%	4%	0 %
6. Degree to make input for changes to the system.	50%	33%	4%	0%	13 %	4%	38%	25%	17 %	17 %
7. Collection device is up to date.	42%	46%	0%	0%	13 %	17%	63%	8%	4%	8 %
8. Software installed on your computer is the most recent.	67%	33%	0%	0%	0%	46%	50%	4%	0%	0 %
9. Does your system operate well with the ships IT21 system?	29%	21%	0%	4%	46 %	17%	29%	8%	0%	46 %
10. Is the time to enter data cards into your system minimum?	50%	38%	13%	0%	0%	4%	54%	29%	13 %	0 %
11. Are there contingency procedures when your computer is down?	50%	46%	0%	0%	4%	4%	46%	29%	13 %	8 %
12. Are there contingency procedures when the TLO's system is not working?	38%	38%	8%	8%	8%	4%	38%	33%	13 %	13 %
13. Is the system responsive to changing user needs?	42%	50%	8%	0%	0%	13%	25%	29%	33 %	0 %
14. Does the system produce professional reports?	38%	58%	4%	0%	0%	17%	42%	29%	13 %	0 %
15. Are the report data accurate?	54%	46%	0%	0%	0%	13%	42%	21%	25 %	0 %
16. Fast response time from helpdesk to remedy issues?	54%	29%	0%	0%	17 %	25%	33%	21%	0%	21 %
17. Positive attitude from Help Desk.	50%	25%	13%	0%	13 %	33%	38%	8%	4%	17 %
18. Fast response time from Help Desk staff to remedy problems.	50%	25%	13%	0%	13 %	33%	29%	21%	17 %	0 %
19. System's ability to improve users' personal	50%	33%	13%	0%	4%	13%	58%	17%	8%	4 %

productivity.										
20. Extent of user training.	58%	29%	13%	0%	0%	8%	46%	33%	13 %	0 %
21. System's ability to enhance the learning experience of the user.	33%	50%	17%	0%	0%	4%	50%	42%	4%	0 %
22. Documentation to support user training is provided.	42%	38%	8%	13%	0%	0%	42%	38%	13 %	8 %
23. System enhances warfighter readiness.	50%	29%	17%	0%	4%	8%	38%	29%	21 %	4 %
24. System provides tangible financial benefit.	29%	33%	4%	8%	25 %	4%	46%	25%	8%	17 %

Table 4. TORIS User Feedback Percentage Responses

Results of respondent's experience and usage:

How long have you been in the current position? (Number of respondents/percentage)			
Less than 1 year	1-3 years	3-5 years	More than 5 years
8 / 33%	15 / 63%	1 / 4%	0 / 0%

Approximately how many hours a day do you use this system in the performance of your duties? (Number of respondents/percentage)					
Almost never	< 1 hour/day	1-2 hours/day	3-4 hours/day	5-6 hours/day	> 6 hours/day
0 / 0%	11 / 46%	10 / 42%	2 / 8%	1 / 4%	0 / 0%

Table 5. TORIS User Feedback Respondent Data

Specific user feedback was generally positive. For the entire list of negative, positive, and other comments, see Appendix A.

2. Continuous Monitoring Program (CMP)

a. Program Manager Research

The stated goals in the program justification for mission improvement are achieved in two ways. First, CMP clearly provides benefit to TYCOM and higher DoN leadership by providing views of the operational readiness of supply departments across the fleet. In addition, it also acts as a valuable tool to assess and correct deficiencies within afloat supply departments. CMP achieves this through its traffic light display of pulse points deemed important by TYCOM staff. This display is powerful, yet concise

snapshot of the given unit's performance and areas that may require additional attention. Additionally, the productivity improvements for supply personnel is significant as representatives from S-1, S-2, S-3, and S-4 divisions can instantly determine the posture of the division. CMP provides this analysis much faster than individually pulling manual reports in each information system. Therefore, the system is currently meeting the mission need as it exists now, and due to its agility, it can be modified to quickly add additional pulse points, as required.

Like TORIS, there are no contractual key performance indicators for CMP, other than the few requirements built into the contract statement of work and listed in Chapter III, used to measure either the system or the contractor's performance. This weakness will be addressed in Chapter V.

Since the casualty of the system will not preclude a ship's ability to get underway, CMP is considered mission enhancing for afloat units, even though its use is required by the Surface Force Supply Procedures (SURFSUP). In addition, it is enhancing to the mission of the ATGs, Class Squadrons (CLASSRONs), Navy Food Management Team, and CNSF staff, that use it for pulse point monitoring and financial information.

Changes to the CMP software system occur often and frequently, in response to primary stakeholders within the CNSF and CNSL N41 staffs, as well as the N00F department. Change requests are submitted to the individual to whom CMP contractors report to: CNSL N411, the N411—Supply Logistics/Readiness Officer.

There are no financial goals established for CMP, which is a weakness that could be possibly addressed in terms of return on investment.

No performance issues related to the information technology infrastructure were discovered during our research or interviews, as the program currently meets all operational requirements.

Shore establishments train various stakeholders on CMP. CNSP and CNSL N4 both provide an overview of capabilities to prospective Commanding Officers and prospective Executive Officers enroute to ships. The Navy Supply Corps School also

provides training to Supply Officers during the Basic Qualification Course and Supply Officer Department Head Course. Finally, Chapter 17 of the CNSF 4440.1 provides an extensive list of instructions for end users.

Finally, no remaining redundancies exist within the system based on the merger between the east and west coast staffs.

b. User Feedback

The following tables capture the User Survey results for the Continuous Monitoring Program (CMP). The quantitative number of responses received was far below anticipated expectations, this despite several follow-up emails and phone calls. The survey responses received were from Defense contractors from two CLASSRONs and one from ATGPAC.

	Importance					Satisfaction				
	Very Important	Important	Somewhat Important	Not Important	N/A	Very Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	N/A
1. Ease of access to system.	2	1				2	1			
2. System easy to use.	3					2	1			
3. Have confidence in system.	2	1				2	1			
4. Degree of personal control over the system.	1	2				1	2			
5. System has up to date hardware.	2				1	1	1			1
6. System has up to date software.	2		1			1	1	1		
7. Interoperable with other systems.	2				1			1		2
8. System's response time.	1	2				1	1	1		
9. Contingency procedures when system is down.	2		1				1	1		1
10. System responsiveness to changing user needs.	1	1			1		1	1		1
11. Flexibility of the system to produce professional reports.	2	1					1	1	1	
12. Report data is verifiable.	2	1				2	1			
13. Fast response time from support staff to remedy technical issues.	2				1	2				1
14. Positive attitude from Help Desk to users.	2				1	2				1
15. Fast response time from Help Desk staff to remedy problems.	2				1	2				1
16. Ability of the system to improve users' personal productivity.	2	1				1	1		1	
17. Extent of user training.	2				1	1	1			1
18. Ability of the system to enhance the learning experience of the users'.	2				1	1	1			1
19. Documentation to support user training is provided.	1				2			1		2
20. System enhances warfighter readiness.	1	1			1	1		1		1
21. System provides tangible financial benefit.	2		1			2		1		
22. Relevant data and metrics are captured by the system.	2	1				1	1	1		
23. System is well aligned across the CNSF claimancy.	2	1				2		1		
24. System supports the goals of the SWE.	1	2				1	1	1		

Table 6. CMP User Feedback Numerical Responses

	Importance					Satisfaction				
	Very Important	Important	Somewhat Important	Not Important	N/A	Very Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	N/A
1. Ease of access to system.	67%	33%	0%	0%	0%	67%	33%	0%	0%	0%
2. System easy to use.	100%	0%	0%	0%	0%	67%	33%	0%	0%	0%
3. Have confidence in system.	67%	33%	0%	0%	0%	67%	33%	0%	0%	0%
4. Degree of personal control over the system.	33%	67%	0%	0%	0%	33%	67%	0%	0%	0%
5. System has up to date hardware.	67%	0%	0%	0%	33%	33%	33%	0%	0%	33%
6. System has up to date software.	67%	0%	33%	0%	0%	33%	33%	33%	0%	0%
7. Interoperable with other systems.	67%	0%	0%	0%	33%	0%	0%	33%	0%	67%
8. System's response time.	33%	67%	0%	0%	0%	33%	33%	33%	0%	0%
9. Contingency procedures when system is down.	67%	0%	33%	0%	0%	0%	33%	33%	0%	33%
10. System responsiveness to changing user needs.	33%	33%	0%	0%	33%	0%	33%	33%	0%	33%
11. Flexibility of the system to produce professional reports.	67%	33%	0%	0%	0%	0%	33%	33%	33%	0%
12. Report data is verifiable.	67%	33%	0%	0%	0%	67%	33%	0%	0%	0%
13. Fast response time from support staff to remedy technical issues.	67%	0%	0%	0%	33%	67%	0%	0%	0%	33%
14. Positive attitude from Help Desk to users.	67%	0%	0%	0%	33%	67%	0%	0%	0%	33%
15. Fast response time from Help Desk staff to remedy problems.	67%	0%	0%	0%	33%	67%	0%	0%	0%	33%
16. Ability of the system to improve users' personal productivity.	67%	33%	0%	0%	0%	33%	33%	0%	33%	0%
17. Extent of user training.	67%	0%	0%	0%	33%	33%	33%	0%	0%	33%

18. Ability of the system to enhance the learning experience of the users'.	67%	0%	0%	0%	33%	33%	33%	0%	0%	33%
19. Documentation to support user training is provided.	33%	0%	0%	0%	67%	0%	0%	33%	0%	67%
20. System enhances warfighter readiness.	33%	33%	0%	0%	33%	33%	0%	33%	0%	33%
21. System provides tangible financial benefit.	67%	0%	33%	0%	0%	67%	0%	33%	0%	0%
22. Relevant data and metrics are captured by the system.	67%	33%	0%	0%	0%	33%	33%	33%	0%	0%
23. System is well aligned across the CNSF claimancy.	67%	33%	0%	0%	0%	67%	0%	33%	0%	0%
24. System supports the goals of the SWE.	33%	67%	0%	0%	0%	33%	33%	33%	0%	0%

Table 7. CMP User Feedback Percentage Responses

Results of respondent's experience and usage:

How long have you been in the current position? (Number of respondents/percentage)					
Less than 1 year	1-3 years		3-5 years	More than 5 years	
1 /33%	1 / 33%		0 / 0%	1 / 33%	
Approximately how many hours a day do you use this system in the performance of your duties? (Number of respondents/percentage)					
Almost never	< 1 hour/day	1-2 hours/day	3-4 hours/day	5-6 hours/day	> 6 hours/day
0 / 0%	0 / 0%	3 / 100%	0 / 0%	0 / 0%	0 / 0%

Table 8. CMP User Feedback Respondent Data

Overall, user feedback was positive, but limited. For the entire list of negative, positive, and other comments, see Appendix B.

3. Commander, Naval Surface Forces (CNSF) Web

a. Program Manager Research

No goals for mission improvement are stated in the program justification. So, the program has few documentable references to how it improves the Command's ability to meet it mission. Like a bulletin board, it is used for informational purposes only, and it is only as good as the currency and relevance of the information posted, as well as how often end users use it to retrieve that information. When used properly though, it is a keen force alignment tool good for spreading policy efficiently, as it reduces the need for redundant messaging.

Like TORIS, there are no contractual key performance indicators for CNSF Web, other than the few requirements built into the contract statement of work and listed in Chapter III, used to measure either the system or the contractor's performance. This weakness will be addressed in Chapter V.

Since the casualty of the system will not preclude a ship's ability to get underway, CNSF Web is considered mission enhancing for afloat units, and there is no written policy requiring its use. In addition, it is enhancing to the mission of the shore commands, who use it solely for information dissemination purposes.

Innumerable changes occur to the CNSF Web regularly, as designated site administrators retain both the privilege and responsibility to update their respective areas of concern. Major change requests, such as the request for a new domain, are sent to the CNSF Web development team.

No financial goals are established for the CNSF Web, which is a weakness that could be possibly addressed in terms of return on investment.

No performance issues related to the information technology infrastructure were discovered during our research or interviews, as the program currently meets all requirements.

There is no formal training provided for the system, as the website is fairly intuitive.

Finally, no remaining redundancies exist within the hardware of the system based on the merger between the East Coast and West Coast staffs. However, some redundancies may be present within the personnel management.

b. User Feedback

The following tables capture the User Survey results for the SURFOR Web. The quantitative number of responses received was adequate based on the numbers of surveys that were distributed by CNSF N6. The survey responses received were from Active Duty military, Civil service employees and Defense contractors from various departments within CNSF.

	Importance					Satisfaction				
	Very Important	Important	Somewhat Important	Not Important	N/A	Very Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	N/A
1. Ease of access to system.	12					6	5	1		
2. System easy to use.	11	1				5	3	4		
3. Have confidence in system.	8	4				2	10			
4. Degree of personal control over the system.	2	6	4			3	7	2		
5. System has up to date hardware.	4	4	2		2	3	4	2	1	2
6. System has up to date software.	5	6	1			2	7	3		
7. Interoperable with other systems.	6	1	4	1		2	5	3	1	1
8. System's response time.	6	6				3	6	3		
9. Contingency procedures when system is down.	7	2	1	1	1	2	2	5	1	2
10. System responsiveness to changing user needs.	5	4	1	1	1	3	6		1	2
11. Flexibility of the system to produce professional reports.	4	4	3	1		4	2	3	2	1
12. Report data is verifiable.	5	3	2		2	3	6	1		2
13. Fast response time from support staff to remedy technical issues.	5	5	1		1	6	6			
14. Positive attitude from Help Desk to users.	5	6			1	7	5			
15. Fast response time from Help Desk staff to remedy problems.	7	4			1	6	6			
16. Ability of the system to improve users' personal productivity.	6	5	1			4	7	1		
17. Extent of user training.	2	6	4			5	2	3	1	1
18. Ability of the system to enhance the learning experience of the users'.	3	3	6			3	4	4		1
19. Documentation to support user training is provided.	4	2	3	3		5	1	3	2	1
20. System enhances warfighter readiness.	9	3				4	5	3		
21. System provides tangible financial benefit.	5	3	2		2	3	5		1	3
22. Relevant data and metrics are captured by the system.	3	7	1		1	3	5	3		1
23. System is well aligned across the CNSF claimancy.	6	4	1		1	4	5	2		1
24. System supports the goals of the SWE.	8	4				5	6	1		

Table 9. CNSF Web User Feedback Numerical Responses

	Importance					Satisfaction				
	Very Important	Important	Somewhat Important	Not Important	N/A	Very Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	N/A
1. Ease of access to system.	100%	0%	0%	0%	0%	50%	42%	8%	0%	0%
2. System easy to use.	92%	8%	0%	0%	0%	42%	25%	33%	0%	0%
3. Have confidence in system.	67%	33%	0%	0%	0%	17%	83%	0%	0%	0%
4. Degree of personal control over the system.	17%	50%	33%	0%	0%	25%	58%	17%	0%	0%
5. System has up to date hardware.	33%	33%	17%	0%	17%	25%	33%	17%	8%	17%
6. System has up to date software.	42%	50%	8%	0%	0%	17%	58%	25%	0%	0%
7. Interoperable with other systems.	50%	8%	33%	8%	0%	17%	42%	25%	8%	8%
8. System's response time.	50%	50%	0%	0%	0%	25%	50%	25%	0%	0%
9. Contingency procedures when system is down.	58%	17%	8%	8%	8%	17%	17%	42%	8%	17%
10. System responsiveness to changing user needs.	42%	33%	8%	8%	8%	25%	50%	0%	8%	17%
11. Flexibility of the system to produce professional reports.	33%	33%	25%	8%	0%	33%	17%	25%	17%	8%
12. Report data is verifiable.	42%	25%	17%	0%	17%	25%	50%	8%	0%	17%
13. Fast response time from support staff to remedy technical issues.	42%	42%	8%	0%	8%	50%	50%	0%	0%	0%
14. Positive attitude from Help Desk to users.	42%	50%	0%	0%	8%	58%	42%	0%	0%	0%
15. Fast response time from Help Desk staff to remedy problems.	58%	33%	0%	0%	8%	50%	50%	0%	0%	0%
16. Ability of the system to	50%	42%	8%	0%	0%	33%	58%	8%	0%	0%

improve users' personal productivity.										
17. Extent of user training.	17%	50%	33%	0%	0%	42%	17%	25%	8%	8%
18. Ability of the system to enhance the learning experience of the users'.	25%	25%	50%	0%	0%	25%	33%	33%	0%	8%
19. Documentation to support user training is provided.	33%	17%	25%	25%	0%	42%	8%	25%	17%	8%
20. System enhances warfighter readiness.	75%	25%	0%	0%	0%	33%	42%	25%	0%	0%
21. System provides tangible financial benefit.	42%	25%	17%	0%	17%	25%	42%	0%	8%	25%
22. Relevant data and metrics are captured by the system.	25%	58%	8%	0%	8%	25%	42%	25%	0%	8%
23. System is well aligned across the CNSF claimancy.	50%	33%	8%	0%	8%	33%	42%	17%	0%	8%
24. System supports the goals of the SWE.	67%	33%	0%	0%	0%	42%	50%	8%	0%	0%

Table 10. CNSF Web User Feedback Percentage Responses

Results of respondent's experience and usage:

How long have you been in the current position? (Number of respondents/percentage)					
Less than 1 year	1-3 years		3-5 years	More than 5 years	
0 / 0%	5 / 42%		1 / 8%	6 / 50%	
Approximately how many hours a day do you use this system in the performance of your duties? (Number of respondents/percentage)					
Almost never	< 1 hour/day	1-2 hours/day	3-4 hours/day	5-6 hours/day	> 6 hours/day
0 / 0%	0 / 0%	3 / 25%	4 / 33%	2 / 17%	3 / 25%

Table 11. CNSF Web User Feedback Respondent Data

Users were primarily positive in their responses. For the entire list of negative, positive, and other comments, see Appendix C.

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V. FINDINGS AND FOLLOW-ON WORK

Reduced budgets and increased scrutiny of staff budget obligations forced the Commander, Naval Surface Forces (CNSF) Comptroller to seek an evaluation of the current information technology investments. The ultimate goal of any Department of the Navy (DoN) information technology program is an outcome that positively contributes to mission effectiveness, as opposed to simply striving to meet pre-existing contractual requirements (Department of the Navy, 2001b). The project sponsor's evaluation request will not only lead to possible resource efficiencies, but will, more importantly, highlight the need for overarching information technology management that supports the subordinate commands within the CNSF claimancy and the DoN's mission effectiveness goals.

This chapter provides the results of evaluations conducted on the three major CNSF information technology programs: Training and Operational Readiness Information Services (TORIS), Continuous Monitoring Program (CMP), and CNSF Web. It includes recommendations for follow-on research.

A. PROGRAM EVALUATIONS

As discussed in Chapter IV, the project evaluation method was to determine the programs' progress in meeting cost, schedule, and performance goals by focusing on five core principles: mission, performance, management, financial, and technical. The following evaluates each program on those principles.

1. Training and Operational Readiness Information Services (TORIS)

The mission set of TORIS is mandated to support the Surface Force Training Manual. Based on feedback received from the program manger and end users, TORIS meets or exceeds expectations in terms of mission support. While the system primarily provides relief from the administrative burdens associated with tracking the training proficiencies for the respective ships within the CNSF claimancy, it also provides a quick

and effective means for senior leadership in all Navy echelons to evaluate fleet readiness, including the ability to get underway while meeting prescribed training goals.

During the course of the research, no major negative performance-related issues were discovered. While this certainly seems positive, unfortunately, we found no performance benchmarks by which to measure the performance of the software application. This makes an accurate determination theoretical at best. The statement of work in the contract does not measure the performance of the system; instead, it is designed to mandate the requirements for the contractor's performance. Therefore, indicators that measure downtime, trouble calls, and software bugs are missing. These are all factors that could assist managers in determining overall performance.

Management of the system is outlined by the statement of work, and by every account, the Afloat Training Group (ATG) staff manages the system well. A configuration control board is in place that makes determinations on what functionality and/or policies require modification, addition, or deletion within the system. By all accounts, there is no oversight of the TORIS system by any technical subject matter experts within the CNSF staff, such as CNSF N6.

Concerning system finances, the TORIS program demonstrates no accurate measure for a capital return on investment. This may hinder the Surface Warfare Enterprise (SWE) leadership decision making in terms of preventing an accurate determination of which programs are providing the greatest mission support in terms of cost and return on investment.

Regarding technical competency, TORIS employs common and up-to-date programming languages that are compatible with other information systems employed by the DoN. During the research phase of this project, it was found that no software or hardware redundancies exist within the CNSF claimancy. This is important to note because of the merger of the CNSL and CNSP staffs.

2. Continuous Monitoring Program (CMP)

The mission set of CMP is directed by the policies promulgated in the CNSFINST 4440.1. Based on the authors' personal experience afloat, program manager feedback, and user feedback, CMP is clearly providing an efficient resource to manage the myriad of readiness and services pulse points that CNSF and Commander, Submarine Force units are required to maintain for the highest level of ship logistics readiness. The summarized pulse-point report in the stop-light format provides all associated users with an effective and quick means to ascertain weak areas within a specific unit, class of ships, or the entire fleet.

CMP system performance appears to operate efficiently. However, like TORIS, while no major software related issues were discovered, there are also no performance benchmarks in place to measure and track actual performance.

CNSF N411 is responsible for the management of CMP, and any change to the system is done in accordance with the policies set forth by the CNSFINST 4440.1. However, much like TORIS, there is no oversight of this application by a technical code, such as CNSF N6. This could present substantial deficiencies resulting in faulty changes, leading to wasted resources.

With regard to system finances, the CMP program demonstrates no accurate measure for a capital return on investment. Like TORIS, this may hinder SWE leadership decision making in terms of preventing an accurate determination of which programs are providing the greatest mission support in terms of cost and return on investment.

Finally, as to technical competency, CMP employs common and up-to-date programming languages that are compatible with other DoN information systems. During the research phase of this project, it was found that no software or hardware redundancies exist within the CNSF claimancy. This is important to note because of the merger of the CNSL and CNSP staffs.

3. Commander, Naval Surface Forces (CNSF) Web

CNSF Web was implemented to provide an efficient and consolidated means of sharing information between east and west coast staffs, along with providing a means for units to host web site services and access TYCOM instructions, policies, directives, and other general information. The program appears to adequately support its mission of force alignment, e.g., communications are facilitated between commands and echelons.

CNSF Web appears to perform satisfactorily. However, like the other two programs, there are no performance benchmarks in place to measure and track actual performance. Adding these checks could enhance user experience, potentially resulting in higher usage rates.

During the research phase of this project, day-to-day management of the system shifted from the West Coast to the East Coast. Complicating the issue was the admission from the project sponsor that a redundancy existed between the program staffs on both coasts. In addition, due to the amount of system administrators, it can be concluded that management of the system is extremely challenging. Unlike TORIS and CMP, CNSF Web does not possess any written policies to delineate the specific responsibilities of the system managers.

With respect to the financial aspect of the system, CNSF Web demonstrates no accurate measure for a capital return on investment. Like the other two programs, this may hinder SWE leadership decision making in terms of preventing an accurate determination of which programs are providing the greatest mission support in terms of cost and return on investment.

Concerning technical competency, CNSF Web employs common and up-to-date programming languages that are compatible with other DoN information systems. During the research phase of this project, it was found that no software or hardware redundancies exist within the CNSF claimancy. This is important to note because of the merger of the CNSL and CNSP staffs.

4. User Feedback

The feedback from the users for all three programs was grouped into five mission areas that were detailed in Chapter IV. The mission areas were used to develop the survey. In summary, more than 87% of the total respondents who reported that these three programs mission areas were either "Important" or "Very Important" in supporting the goals of the Surface Warfare Enterprise. Relatively few respondents—less than 13%—reported negative feedback. Chapter IV provides a detailed breakdown of the respondents reviews. For a list of hand-written comments, refer to Appendices A through C.

B. FINDINGS AND RECOMMENDATIONS

This section answers each research question, and it offers two types of suggestions. The first set of suggestions deals with improvements that CNSF can employ in the short term. The second set presents options for follow-on research activities.

1. Research Question Findings

First, to answer the specific research questions delineated in Chapter I:

What programs are currently being funded?

The programs currently being funded are TORIS, CMP and CNSF Web, and they were the subject of this report. CNSF expended approximately $5.5M during Fiscal Year 2009 on these programs with the following breakdown:

- TORIS: $2.3M
- CMP: $997K
- CNSF Web: $2.2M

Why are they being funded, e.g., what programs and commands do they affect?

TORIS supports the training readiness of the fleet, building toward the currently available war-fighting capability of the force in three ways. First, through onboard training record processes, it provides command leadership with a snapshot of current training proficiency for all warfare areas, and it allows shipboard leadership to develop

plans to improve weaker areas and reinforce stronger areas. Second, through the time-shortened inspection certification processes, it facilitates ship's deployment certification faster. Finally, via the automatic population of Defense Readiness Reporting System (DRRS) via TORIS's Training Figure of Merit (TFOM) metrics, it provides Office of the Secretary of Defense (OSD) the readiness level of any Navy unit, and it supports critical decision making process to deploy units in a timely manner based on accurate, up-to-date information.

The primary mission need of CMP is fleet readiness, and the program supports this by bringing attention to potential supply department deficiencies, which could degrade into significant problem areas for ships in training or on deployment. It does this through the extraction of data, called pulse points from the following Information Systems: R-Supply, Micro-Snap, Food Service Management, and ROM II. In addition, it provides 95% of required Supply Figure of Merit (SFOM) data to Defense Readiness Reporting System-Navy (DRSS-N).

The primary mission support function of the CNSF Web is force alignment. It links the primary staff functions of all echelons within the chain of command, from the deck-plate level to the Commander, Naval Surface Forces, in one electronic location. It also provides the resource for staffs to: publish policies and directives, follow various operational metrics, and communicate with each other on pertinent topics. It is the primary tool utilized by CNSF to meet the Chief of Naval Operations (CNO) FORCEnet, "Alignment" and Sea Enterprise goals along with the business requirements of the SWE. Finally, it appears to provide an enterprise solution for the claimancy, as a certified Enterprise-Level collaboration portal.

What commands do they support?

All three programs support the SWE, all units within the CNSF claimancy, and echelons above the TYCOM level.

What are the specific services to be supported as identified by contract terms?

The specific services are detailed in the Statement of Work within each contract, which can be found in Chapter III.

Are there redundancies in services provided amongst the various programs?

There appear to be no redundancies in hardware or software systems for each of the three programs in question. However, there may be some duplication of management efforts within CNSF Web.

2. Recommendations

In conclusion, the following are four specific recommendations for positive change that CNSF could undertake in the short term, including two follow-on research project concepts.

a. Improve Managerial Oversight

Based on DoN information technology systems and applications policies, there is little to no expectation that the CNSF Comptroller is able to ascertain the fleet requirement of any of the programs that were researched in this project. The current funding process calls for the applicable program manager to submit a program justification statement along with their specific request for funding. These justification documents seemed to provide little in terms of managerial oversight. Similarly, they offer little means for the Comptroller to discern the funding priorities within the CNSF claimancy.

CNSF N6 is the most technically equipped to determine the funding priorities of all information technology applications, and it should provide SWE level management oversight to ensure that these programs are supporting the mission and goals set forth by the CNSF Commander and SWE Charter.

b. Establish Key Performance Indicators

Key Performance Indicators (KPIs) apparently do not exist for the three programs, as explained in their performance evaluations. We recommend that all future systems have relevant, clearly defined, and measurable KPIs built-into the various programs. Additionally, generate KPIs for all current systems. KPIs will provide a

crucial evaluative component necessary for managing and adjusting any complex process or mechanism, including direct customer/user feedback pinpointing areas for improvement.

c. Design and Refine upon Attributes of Successful Information Technology Systems

As detailed in Chapter IV, successful information technology systems can be characterized through the demonstration of six quality attributes. Mastery of those attributes—usability, interoperability, responsiveness, maintainability, scalability, and standardization—can improve customers' experience, ease the path for future modifications, and increase each program's mission supportability. While easiest to build upon in the system design phase, program managers and CNSF technical experts can continually diagnose and refine their systems for improved performance.

d. Follow-up this Baseline Assessment in the Future

A baseline assessment is designed to establish the snapshot picture of the status quo. We recommend that CNSF conduct periodic follow-on assessments to ensure that priorities are understood and met. Failure to do so should not be an option. Therefore, as described in Chapter II, subsequent assessment should follow up this baseline assessment in order to maximize the chance of the project sponsor reaching its goals.

e. Conduct Follow-on Research to Develop an Information Technology Strategy and Acquisition Strategy

This project begets two follow-on research projects. The next group should develop an information technology strategy, which would be a top-down expression of the command's determination of its information technology objectives. The third and final group could compose an acquisition plan as a way-ahead for CNSF resource allocation.

Developed strategies follow the DoN Information Technology Capital Planning Guide because it defines each strategy and details the recommended steps to establish them.

Particularly, it calls for the Information Technology strategy to:

> State senior leadership priorities for IM/IT; reflect vertically, the overall non-IM/IT mission priorities of DoN and DoD, and provide a focused framework for linked implementation of all IM/IT initiatives within DoN; establish performance measures to determine progress towards accomplishing objectives. (Department of the Navy, 2001b)

The acquisition strategy could be coordinated with the information technology strategy. The way ahead will likely include continual diagnosis of the ongoing procurement process and recommended actions for CNSF resource allocation.

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APPENDIX A: TORIS USER FEEDBACK

Written feedback from user surveys, negative comments regarding this system first:

- "System did not convert old program (ship) file to new (TORIS) update."
- "TORIS system may need to be more fluid in change to instruction changes and new equipment implemented to the fleet."
- "Some improvement in training (user friendly) may be required."
- "Systems slow on inputs for CCR."
- "Updating cards not being updated have to log-off and login about two times."
- "Never received any system training other than that provided by divisional personnel."
- Seems to be very difficult to query the database for specific information and seems to require an official request for what should be fairly simple database function."
- "N/A function should be ATG/TRAINO only function."
- "Deletion of cards past seven days requires system admin access."
- "Ship inputted data vs. ATG inputted data is not clearly identified. Recommend to restrict ships ability to input data cards when not self-access."
- "Not able to see ship trends through a database query."
- "Using TORIS takes a lot of time. The system is slow."
- "TORIS is not specific in capturing actual operator proficiency over procedural proficiency."
- "TORIS log in is problematic. The system continually crashes."
- "The new DDGs on the waterfront have different equipment that does not relate completely to some of the TORIS Cards requirements, i.e DMRs have replaced WSC-3s, classified and unclassified servers no longer have tape drives and cannot store backups in a remote, secure location."
- "MSP doesn't always work, freezes and doesn't always update."
- "The tough books work fine, but we need more of them."

- "There is little or no training. I received my training on the job and by trial and error."
- "Inaccurate at times."
- "Difficult to learn, not intuitive."
- "Easy to falsify data."
- "System not able to easily tailored to specific platforms by end users."
- "System does not appear to be stable. Changes often are not saved and system "locks-up."
- "Transferring data from the laptop while on the ship to the LAN."
- "I can't use my CAC access to log on."
- "I have to change my password too often."
- "Sometimes the system is too slow to load."
- "Initial and upgrade user training is generic. Recommend including hands-on training sessions with actual fleet scenarios to increase knowledge base and detect program flaws/bugs. This would allow for direct feedback from end-users to enhance the implementation of newer versions."
- "Stand alone TORIS program support/help link could be more user-friendly. This tool is very important when training teams are onboard ships underway and unable to directly interact with technical support personnel."
- "MSP Trainer Time report sub-events section includes a column for tracking time spent conducting Full Power Demo. This column is never used during training events and should be changed to classroom training to more accurately capture time spent during LTTs. Additionally, MSP data and TORIS data are not interlinked for information sharing purposes. A link could be added to the TORIS database that allows the user to view the number of LTTs and ULTRA events conducted per ship for a selected period."
- "In reference to TORIS Supply, if a call is checked as N/A a trouble call needs to be put in to get it changed. Something as simple as a check in the box should be the users call to check or uncheck without a trouble call. Or editing the N/A call without assistance. Additionally, it takes administrator longer to provide assistance with a trouble call which delays the TORIS posting process. Thje problem is as follows: R-Supply (Unit Level) Accountability, RSA-003—LOCATION AUDIT, the table for DLR and REPAIR PARTS do not calculate properly when posting;

and, the numbers inputted in #INVENTORIED, #CORRECT, and ACCURACY blocks do not post/record while posting and do not show in the Summary Report when viewing the report for printing. There has been 3 trouble call attempts to correct this issue."

- "In reference to TORIS MSP, users are unable to make changes to correct time onboard for training and posting trainer times."

Positive comments about this system:

- "The help desk is very expedient in fixing problems."
- "Transfer from Team Lead to TLO information is good."
- "Tough book is durable, small, and easy to lock away."
- "System provides current status (when accurate)."
- "System use appears to be fairly simple."
- "If used correctly, allows for planning."
- "If used properly, allows for ships to see mission area readiness."
- "Collective based data points allow for multi-scenario gain of CDPs."
- "The system is available for the entire chain of command to view it and understand."
- "The system is organized."
- "It's better than nothing."
- "The updates to TORIS have been swift and without any major interruptions."
- "It is fairly easy to use basic functions."
- "Ease of tracking events."
- "Quantitatively demonstrates readiness."
- "Gives direct feedback on areas that need to be trained to."
- "Provides quantifiable status of ship's training to ISIC."
- "Pretty easy interface to operate."
- "Nothing truly positive. It's a mandatory program for shipboard training."
- "Easy to look up information."
- "Easy to input information."

- "Easy to access specific information."
- "Fairly easy to use."
- "Provides clear data on where a ship stands during the training cycle."
- "Data cards are easy to access and update and accurately populate the CCR tracker ensuring data reflects current proficiency."
- "Data files are easy to generate and export to ship TORIS database."
- "Help desk and TORIS support personnel are very knowledgeable and helpful when resolving issues. Tough books are updated regularly to ensure dependability and that newest software versions are available."
- "Everything is on one site. Big plus you don't have to have multiple sites to search through to get what you need."
- "CTRs are on top of the trouble calls never an issue getting things updated or fixed."
- "Access is simple, easy to follow directions and maneuvering through TORIS is quick and painless for the most part."

Other amplifying information:

- "With more official training, the time required for personnel to become proficient in its utilization could be maximized."
- "Ships are not using TORIS properly. Establish a level of knowledge representative for each mission area on ships and restrict who is able to input data."
- "The change process takes way too long. If things are wrong, we need to fix the problem, not wait until the next revision to fix what is broke."

APPENDIX B: CMP USER FEEDBACK

Written feedback from user surveys, negative comments regarding this system first:

- "When out putting files into Excel, "E" series requisitions tend to get messed up. It is read as a formula and not a text block."
- "Inflexibility to combine several reports into one package."
- "In some cases the reports only give the surface information. When digging into the weeds we find that GREEN isn't always GREEN."
- "Program does not send or raise flags when monthly/weekly ship's comments are not provided for areas identified by being RED or YELLOW by the users submitting the data. Examples, areas that are flagged red should force the users to provide comments regardless of whether it's a system problem or user self-inflicted."

Positive comments about this system:

- "Program is constantly evolving. That's a good thing."

Other amplifying information:

- "May want to offer some training on generating self-defining reports."

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APPENDIX C: CNSF WEB USER FEEDBACK

Written feedback from user surveys, negative comments regarding this system first:

- "SIPRNet version is slow, clunky and is not user friendly."
- "Front page seems to never change even though I know new content is being added all the time."
- "Main site seems disorganized and search is often broken making it hard to find documents I'm looking for - CLASSRON Web is organized much better."
- "Being a member of the SURFORWeb Team, my biggest concern is the size of my team being able to keep up with the number of requests that members submit to us and how quickly we are able to satisfy their needs. Therefore; Time constraints and resources are my major concern with the system."
- "Turnover. In two respects. When someone leaves a position and they have a 'good' track record of letting the system work for them, document management, list item management, expiring announcements / content, it often does not convey well to the incoming person and they let a good process die."
- "Naysayers / non-believers / stove-pipers."
- "Inability to generate reports in a clean format ready for presentation to Admiral Staff. Looking for the ability to generate an automated report from a list without first exporting it to Excel."
- "System timeouts. I will modify a page or add new information and receive a blank white page lacking any error message."
- "Changing permissions of a child site back to the parent site once custom permissions have been created."
- "Maintenance is scheduled during East coast work hours."
- "Navigation is not intuitive for every function."
- "Access can be difficult, sometimes the system does not respond to the normal means of access, requiring operator to back out and start again. System requires both CAC and User/Name Password for access. Worse. Every file download requires user name/password access - not productive."
- "What kind of organization in today's Navy does not include their senior enlisted, not in a link, not even on an organization

chart…CSO is listed for ships and other commands - but not the senior enlisted - it is no wonder they are having so many problems in the surface community. The Force Master Chief in one link is two FMCs ago (Hakim Diaz was replaced by Jerry Hauter who is now also retired and replaced. This is 2009 not 1809."

- "We do not always get advised of outages that affect web services."
- "Software for command website development is Share Point restricted."
- "SharePoint has security issue with Word documents. Requires another User Log-in."
- "When the system is down or reduced in functionality (which is not frequent), the lag time in getting things back up can sometimes be considerable since it is located on the opposite side of the country. I'm not sure if that's the only factor, but I know it contributes."
- "I'd like to see a greater variety of user modules (web parts) available that better leverage the large SharePoint development community."
- "It would be good to have some more advanced area administrator-level user training that gets into the details of how to construct complex web parts, leverage SharePoint lists and databases etc., that cater to users that are more familiar with the system and would like to use more complex functionality."

Positive comments about this system:

- "Easy access."
- "Good source of helpful information."
- "It's easy to get and maintain my user account and access to pages I need access to."
- "There's lots of great information in the site."
- "The portions of the site that have fresh content and intuitive look/feel (CLASSRON WEb N7 pages) are a pleasure to use."
- "SURFORWeb, designed in SharePoint, provides the ability to collaborate on policy, not only spanning the distance between the two coasts, but also supports world-wide collaboration."
- "Alerts are handy features that help people answer immediate questions."

- "SharePoint is a versatile tool. It can help people manage in a variety of ways, meeting sites, team sites, announcements, lists. It's just a great tool!!"
- "Lists capability. Makes managing action items and information very easy and accessible."
- "Auto alerts - helps keep track of site use and modifications."
- "Having the choice to modify web parts in Rich Text Editor and Source Editor. Makes it easier to teach to other administrators who may not have a code background."
- "Easy to navigate."
- "Generally well laid-out, with respect to info available."
- "Wide assortment of information, has great potential that is yet untapped."
- "Good place to park current info for use by others, as long as it is kept up to date."
- "The helpfulness and resourcefulness of the SURFOR Web services when approached with an issue."
- "I believe the service to the fleet provided by SURFOR web services is second to none."
- "Shellie Underwood and John Dyar have been great to work with for the past 3-4 years. We have had many challenges with BRAC, and consolidation of resources."
- "Provides good storage capability."
- "Provides ability to load Word, Excel, and Power Point documents."
- "The system is very reliable, works consistently and is well-supported by a knowledgeable local staff.
- "It has proven to be an invaluable tool for for organizing the countless working groups, sub-teams and initiatives that are constantly being created."
- "The development staff is unusually helpful and approachable."

Other amplifying information:

- "Our biggest hurdle is Top down guidance / support. Personnel simply will not use a system that isn't fully supported by the Front Office staff. The Front Office, neither the VADM nor his staff realize the significance that this system could save them in terms if it were embraced."

- "Need a help/how to use section, recommend another survey - from someone - just like this in 6 months to the same respondents."
- "The system is flexible, the support & development staff competent and responsive. I'd like to see them have a greater degree of control over system configuration and/or administration to be able to both react to unique user needs as well as more rapidly support system errors or downtime. I realize that much of this is out of their hands, but the system has become (especially over the last 1.5 years) critical to our enterprise goals as a central communications hub."

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